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## *Greek and Latin in Biological Nomenclature*

FREDERIC E. CLEMENTS

"Nomina Veterum Graecorum et Romanorum plantis imposita laudo, ad conspectum vero Recentiorum plurium horreo. Nec mirum factum! quis enim Tyro de nominibus fuit unquam instructus? quis unquam dedit circa denominationem plantarum praecepta, demonstrationes, exempla?" Linnaeus *Critica Botanica* I 1737.

The following treatise is intended to serve as a compendium of the principles of word-formation in Greek and Latin of sufficient thoroughness to enable the biologist to construct in proper manner any derivative desired. Further than this, various unfortunate usages which have obtained in nomenclature and the many types of malformations will be considered in detail, and suggestions will be made for their correction or elimination. The treatment throughout is based upon the conviction that no biologist should be content with a nomenclature that is doubtful or crude in its philology. On the other hand, ultra-purism, together with the mooted questions pertaining solely to the classical philologist, will be avoided, since nomenclature for the sake of uniformity and stability must rest upon the assured. For these reasons, also, it is felt that, while he must conform to the best usage of the language, the nomenclator must go a step further, and, in the case of uncertain or various usage, establish a definiteness which the language itself did not know. Further warrant is found for this in the fact that the careless hand of

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analogy is always busy throughout the life of a language, and, also, in the fact that the lexicon must take account of all usage, with the result that the cruder derivatives of formative and decadent periods of the language are found alongside of the purer, or at least more refined forms of the classical period.

While Kuntze's important contributions and the Rochester Code have been notable achievements on the way toward nomenclatural reform, it has been evident from the first that botanists had merely reached a temporary resting place, from which they must sooner or later go forward to the ultimate goal—a uniform and stable nomenclature and terminology of international recognition. The failure to deal with the matter of generic types and word-formation, both only less important than the cardinal principle of priority, made a reopening of the question inevitable, an event which is rapidly being brought about by the increasing frequency of papers upon nomenclature. The zoologists, while they have not gone so far in certain lines as the botanists, have greatly anticipated them by their action at the Zoological Congress of 1901, when they agreed to place zoological nomenclature upon a classical basis. Sooner or later, botanists must take the same action. When this time comes, biological nomenclature will be in a fair way to become a symmetrical, stable structure, based upon the two cardinal principles, priority and classicity. There can be little difference of opinion in regard to the repeated statement that nomenclature is merely an instrument in the hands of the biologist, and there should be just as little question that the instrument should be a worthy and ready one.

### I.

Classical Greek and Latin are the basis of scientific nomenclature.

"Idiotae imposuere nomina absurda." Linnaeus *Philosophia Botanica* 158 1751.

There has never been any serious question concerning the necessity of a universal language for the natural sciences. The ancient and medieval development of biology, carried on first

by Greek and Roman philosophers, and then perforce by men who had at least some knowledge of Greek and Latin, determined irrevocably that this scientific language should be Latin, immeasurably enriched by Greek derivatives. So natural and complete, indeed, was this linguistic heritage from the ancients and the herbalists that Linnaeus merely simplified the syntax, definitised the vocabulary, and modified the use of Latin, with its incorporated Greek, to obtain a great binomial system, without which taxonomy as it is to-day would have been impossible. Since Linnaeus, no botanist has questioned the right of Greek and Latin to constitute the language of science. DeCandolle did indeed point out the many advantages English would possess as an international means of communication between scientists, but it was hardly his thought that English would supplant Latin as the language of taxonomy. The realization of the suggestion, in view of the fact that biological publication is made in sixteen languages, among them Russian, Magyar, and Japanese, is anything but imminent. Yet, while biologists are agreed that Greek and Latin shall furnish the materials for nomenclature and terminology, their practice, unfortunately, is still very far from uniform. Personal and vernacular terms from all possible sources have increased to such an extent that nearly a sixth of our present generic and specific names are derived from vernacular tongues. The economy of time and intellectual effort obtained by the use of such names is so considerable that they will always appeal to the poorly prepared or indifferent descriptive biologist. But they offend all the canons of uniformity and taste, and the real taxonomist, whose work is thorough and painstaking from the first glimpse of a new organism to the final publication of its name and diagnosis, will avoid them.

The best Greek and the best Latin available are alone good enough for biological nomenclature. The Greek and Latin of Linnaeus were the work of no very certain hand, and should not constitute the standard, when a better standard is obtainable. Linné's knowledge of word-formation in Greek was often elusive, though his names are far superior as a rule to those of more recent coinage. Similarly, the formations of Byzantine



Greek and Late Latin, as well as those of many preclassic authors in both languages, have little value for the nomenclator. Classic Greek and Latin only can be fully satisfactory, since they are not merely the best Greek and Latin obtainable, but, also, because they present the best conditions for securing essential uniformity. Again, it should be clearly understood that classic Greek and Latin are not necessarily the Greek and Latin of the extreme purist.

## II.

A name or term is invalid unless constructed according to the principles of word formation in classic Greek or Latin; alternatives are to be reduced to a uniform basis. Retroactively, all terms improperly constructed shall be corrected, except in the case of words of uncertain or unknown etymology, when no correction shall be made if any proper Greek or Latin construction will give such a word, with a possible meaning.

"Nomina generica ab uno vocabulo . . . fracto altera integra composita Botanicis indigna sunt." *Critica Botanica* 29 1737.

"Nomina generica ex duobus latinis vocabulis integris et conjunctis vix toleranda sunt." *Ibid.*, 26.

This rule finds its warrant in the fact that uniformity is a first requisite of nomenclature as purity is of linguistics. A malformation is not only unpleasant as well as incorrect philologically, but it is also extremely unfortunate by reason of the complications which it introduces into nomenclature. The philologist is satisfied only with most skilful handling of derivatives that is possible. He will no more be guilty of a malformation or a hybrid than the true scientist will be capable of a bit of superficial or bungling work. The latter must then learn to look upon linguistic matters with the same conscientiousness that he uses in scientific investigation. Ultimately, however, he must be prepared to go farther than the philologist even, for the sake of uniformity. The latter is chiefly concerned with the development of a language, or group of languages, and with him slightly different or alternative forms are of advantage rather than a source of difficulty. In science, where the form and ap-

plication of each name or term should be absolutely fixed, alternative forms of words and alternative methods of composition lead inevitably to grave confusion. The nomenclator must in consequence outdo the philologist in his own field. When it is possible to obtain essentially the same derivative in several slightly different forms by varying the stem of the first term, the connecting vowel, or the form of the last term, or by proceeding from alternative forms of the same word or stem, then the nomenclator must make the most intelligent choice possible in the selection of the best form to use, or the best principle to govern. In so doing, he will often strengthen the hands of the philologist, since it is a well-known fact that many alternative forms are merely the bungling creations of the decadent period of a language.

In choosing a principle for guidance in dealing with alternative forms and methods of derivation, several courses have been considered. The first plan was to follow the usage in the case of each particular word, but it soon became evident that no one but a specialist in philology would be able to make derivatives at all, since the usage varied repeatedly in words of the same group. A similar attempt was made with regard to the best usage, but, while this led to somewhat greater uniformity, the results were not much more satisfactory, and the labor involved was enormous. From the first it was seen that, while an occasional word would deviate more or less regularly from the formation typical for its group, as in the case of the imparisyllabic neuter, *στόμα*, *στόματος* (mouth), which regularly enters into composition in its shortened stem form, the philologically correct stem, or the correct connective, was overwhelmingly predominant. Furthermore, since such usage includes the best usage in all cases, it was concluded that uniformity and purity could best be obtained by making this the invariable usage for all the stems of any group, as well as for all combinations of each stem.

The justification of such a rule may be readily found in a consideration of imparisyllabic stems, which have constituted the most fertile source of alternatives. The Greek neuters in *-μα*, gen. *-ματος*, furnish a large number of examples in which the

shortened form of the nominative and the stem proper of the oblique cases alternate in word-formation. The Greek lexicon exhibits 1,782 neuters of this class, of which 231 appear in 969 derivatives as the first term. In the latter the proper stem appears in 781 words, while the shortened form appears in 188 words. The alternation of these stems in Greek has of necessity given rise to corresponding alternatives in nomenclature. Thus, there are found *Grammonema* Ag. 1832 and *Grammatonema* Kuetz. 1845, *Lomaspora* DC. 1821 and *Lomatospora* Reichenb. 1828, *Spermodermia* Tode 1790 and *Spermatodermia* Wallr. 1833, *Stomotechium* Lehm. 1818 and *Stomatotechium* Spach 1843. Unfortunate and confusing as the variants of the same generic name are, the case is very much worse when the variations of one stem furnish two otherwise valid generic names, as in the case of *Dermatocarpus* Eschw. 1823 and *Dermocarpa* Crouan 1858, *Grammocarpus* Seringe 1825 and *Grammatocarpus* Presl 1831, *Haemospermum* Reinw. 1825 and *Haematospermum* (Wallich) Lindl. 1836. In the former, we are concerned merely with uniformity, desirable as that may be, while in the latter the validity of a generic name is destroyed because of its essential identity with an earlier name, an identity of which the later author was probably unaware. Such fatal duplication of generic names can only be avoided by stringent rules for securing uniformity in methods of derivation. *Myosurus* L. 1737 (*Myosuros* Dill. 1719) and *Myurus* Endl. 1837 are again alternative forms of the same compound word, which have been applied to different genera. The former illustrates the rare and archaic type of syntactic composition, the latter follows the usual method of composition by stems. In the case of *Coleosanthus* Cassini April 1817 and *Coleanthus* Seidl July 1817, the latter, though correctly formed, falls by the working of priority before the former, which is a blunder, equally indefensible from the standpoint of syntactic or non-syntactic composition. *Callitriche* L. 1751 and *Calothrix* Ag. 1824 illustrate the confusion that arises from using alternative Greek words (*καλλι-*, *καλός*, beautiful) and from the variation of the termination of the last member of the compound. Either first term is correct, but their compounds are



identical in meaning and essentially so in derivation. They are to be regarded merely as different forms of the same compound, and *Calothrix* becomes a homonym. The confusion wrought by alternative forms and blundering construction is nowhere better shown than in the following series of names, belonging to five different genera: *Asterothrix* Cassini 1827 (*Asterotrix* Brogn. 1843, *Asterothria* Gren. 1850), *Asterotrichion* Link 1840 (*Asterostrichion* "Klotsch" 1840, *Asterotrichium* Witts.), *Asterotrichia* Zanard. 1843 *Astrotricha* DC. 1829 (*Astrotrichia* Rchb. 1837), and *Asterotrichum* Bonord. 1851.

The retroactive application of this rule is imperative for the sake of uniformity and purity. By far the greater number of plant genera have already been recognized and named. The new names to be proposed for years to come will be relatively few, and a reform which affected even all of these would be barely worth while. Further than this, most new names are made after the pattern of names already in use, whether correctly or incorrectly formed, a practice certain to perpetuate the blunders of the past. Arguments from the standpoint of purity are equally cogent, but, as they would perhaps appeal to the philologist alone, they will not be insisted upon here. A rule of this sort to be at all worth while must be retroactive, for by retroaction alone can confusion be avoided and uniformity secured. The retroactive operation of the rule must be so safeguarded, however, that changes for reasons of uniformity or purity will be made upon real and not upon supposititious grounds. Framers of generic names have been extremely careless in the matter of indicating etymologies, but this is not sufficient warrant for reconstructing names upon the basis of supposed meanings. Many a genus has received a name of known or evident etymology, but of meaningless or mistaken application, a fact which should restrain us from correcting words of unknown derivation on the basis of an assumed etymology. In making changes to secure a more uniform and stable nomenclature, the greatest care must be taken to minimize the error arising from personal judgment. In many words of uncertain etymology, several derivations are equally plausible, or at least possible, and the exercise of per-

sonal choice would simply lead to greater confusion. For these reasons, changes in words where the etymology is not expressly indicated or clearly evident should not be made, unless the proper formation of such a word in Greek or Latin fails to give a name of any possible meaning. The correction of such words as fall under this rule can only be made upon the basis of greatest probability, which, unsatisfactory as it may be, will conduce to the ends sought.

### WORD FORMATION IN GREEK

Greek words arise by derivation or by composition. In derivation, roots or stems acquire a new meaning through the addition of a suffix, a termination having no separate existence in the language, except in the rare case of certain words which have lost their real significance and are now found only as suffixes. In composition, two, rarely more, words are united according to certain rules to form a new term, or compound, in which the meaning of each may be traced. Formation by prefixes is really a sort of composition, except in the case of a few inseparable particles, which properly belong under the head of derivation. For the sake of convenience, however, all formation by prefixes will be considered under composition.

Greek has obtained its stems by derivation, i. e., by adding suffixes to roots, a process to which the origin of all simple words may be traced. Derivation belongs chiefly to the earlier development of the language, and, indeed, is very largely prehistoric, especially in the case of primary derivation. Composition, on the other hand, is a much later development, and must have attained its maximum in the classical period of Greek literature. Both derivation and composition afford the biologist the means of coining new words. For various reasons, among them convenience and usage, scientific terms have been taken directly from the Greek lexicon (sometimes, of course, they have been found already borrowed in Latin), or new words have been formed by composition. Formation by derivation is equally valid, and the fact that it almost invariably gives shorter words leads one to wonder that it should not have come into general use. The reason may be found in the fact that word-formation

in biological nomenclature has been far from scholarly, and that derivation requires much greater care and knowledge than composition does. It is also true that the possibilities of derivation in Greek, though large, are necessarily limited by the relatively small number of suffixes, while the sources of composition are practically inexhaustible.

#### DERIVATION

Derivation consists in the addition of one or more suffixes to the primitive, irreducible portion of a word, which is termed a root. It may be distinguished as primary when one suffix is added to the root, making a stem, secondary when a second suffix is added to the stem, tertiary when a third suffix is attached, and so forth. For convenience, however, we may follow Henry,<sup>1</sup> and term those derivatives primary in which the root carries a single suffix, and secondary, all those in which the stem thus formed has been modified by one or more accretions. Furthermore, derivatives are classed as verbal when the suffix added permits of conjugation, and nominal when it permits of inflection. It is important that this be kept distinct from the fact that certain suffixes can be added only to verbal stems, while others can be attached only to nominal (denominative) ones. Nomenclature is not concerned with the construction of verbal stems, and the suffixes which follow are those which form nominal stems, i. e., nouns and adjectives.

Primary derivatives are formed by attaching the suffix immediately to the root, though rarely an adventitious *-σ-* intervenes. Secondary derivatives are made in similar manner by adding the suffix directly to the stem. In both cases, the groups of letters thus brought into contact conform to certain general phonetic principles of the language. For convenience in making the changes, which arise in this way in derivation and composition, a short summary of the phonetic mutations in Greek is given. Mutations peculiar to verbal stems are omitted. A more complete account of these phonetic laws may be found in any of the more comprehensive grammars.

<sup>1</sup>Henry, Victor. *A Short Comparative Grammar of Greek and Latin*, 102. 1890.



## GENERAL PHONETIC PRINCIPLES

*Aspirates*

In composition, aspirates ( $\chi$  (kh),  $\phi$  (ph),  $\theta$  (th)) arise when a surd ( $\kappa$ ,  $\pi$ ,  $\tau$ ), usually by elision of the final vowel of the stem of the first term, comes in contact with an initial aspirated vowel of the second term.

δέκ(α)-ἡμέρα = δεχήμερος, ten-day

ἐπ(ί)-ἔδρα = ἐφεδρος, seated upon

ἀντ(ί)-ὄρος = ἀνθορος, an opposite limit

Very rarely, this influence is exerted through an interposing consonant.

τέτρ(α)-ἵππος = τέθριππος, with four horses abreast

*Accumulation of Consonants*

As a rule, groups of consonants are modified to prevent harshness. Generally, three successive consonants, or a consonant and a double consonant, are avoided, or one letter is dropped, unless the first or last is a liquid ( $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\rho$ ), or  $\gamma$  before a palatal ( $\kappa$ ,  $\gamma$ ,  $\chi$ ,  $\xi$ ).

πέμπτος, fifth; σκληρός, hard; σάλπιγξ, trumpet

In composition, final  $\kappa$  or  $\sigma$  of the first term may stand before two other consonants.

ἐκστροφή, dislocation; ἐκφθείρω, to destroy utterly

The concurrence of two consonants, when it produces harshness, is avoided in several ways.

- (1) When, by the transposition or loss of a letter,  $\mu$  or  $\nu$  stands immediately before  $\lambda$  or  $\rho$ , the corresponding sonant ( $\beta$ ,  $\delta$ ) is inserted.

μῆς(ος)-ἡμέρα = μεσημ(ε)ρα = μεσημβρία, midday

ἀνήρ, genitive, \*αν(ε)ρος = ἀνρός, = ἀνδρός, man

- (2) A consonant is sometimes transposed to a more convenient position.

πυκνός, genitive, πνίξ, nominative, meeting place

*Assimilation.*

Two explosives can occur together only when the latter is a dental ( $\tau$ ,  $\delta$ ,  $\theta$ ). In such a group a palatal or labial must be of the same order, and another dental is changed to  $\sigma$ ;

κ and π can alone stand before τ, γ and β before δ, and χ and φ before θ, while σ may occur before all three.

φλεκτικός, burning, from φλέγω, to burn; τριπτήρ, rubber, from τρίβω, to rub

πλέγδην, entwined, from πλέκω, to twist; γράβδην, grazing, from γράφω, to grave

σχιστός, cloven, from σχίζω, to cleave; πειστέον, persuaded, from πείθω, to persuade

ἐκ, from, always retains its final palatal in composition.

ἔκδημος, foreign; ἔκθυμα, pustule

Before σ, β and φ become π, γ and χ become κ, while τ, δ, and θ are dropped; κσ is then written ξ and πσ is written ψ.

χάλυβος gen., χαλυβ-ς nom. — χάλυψ, a Chalybean\*

γράφω, γραφ-σω = γράψω

μάστιγος gen., μαστιγ-ς — μάστιξ, whip

τριχός gen., θριχ-ς — θρίξ, hair

χάριτος gen., χαριτ-ς — χάρις, grace

λαμπάδος gen., λαμπαδ-ς — λαμπάς, torch

κόρυθος gen., κορυθ-ς — κόρυς, helmet

This rule applies to such groups as -κτ-, in which the τ is first dropped and the κ then passes into ξ.

νυκτός gen., νυκτ-ς — νύξ, night

Before μ, labials (π, β, φ) become μ, palatals (κ, χ) become γ, and dentals (τ, δ, θ, ζ) become σ.

βλεπ-μα (βλέπω) = βλέμμα, glance; τριβ-μα (τρίβω) = τρίμμα, anything rubbed; στεφ-μα (στέφω) = στέμμα, garland; πλεκ-μα (πλέκω) = πλέγμα, anything plaited; τευχ-μα (τεύχω) = τεύγμα, a work; ᾄδ-μα (ᾄδω) = ᾠσμα, song; σχιδς-μα (σχίζω) = σχίσμα, cleft; πειθ-μα (πείθω) = πείσμα, cable.

ἐκ remains unchanged; ἔκμαγμα, a wax impression

The dentals (τ, δ, θ, ζ) are retained only before λ, ν, ρ. Before μ, they become σ (see above), as also before each other; before σ they are dropped.

πειθ-τικός (πείθω) = πειστικός, persuasive; ἡδ-θημα (ἡδομαι) = ἡσθημα, delight; σπερματ-σι, dat. (σπέρματα) = σπέρμασι; σχιδσ-σις (σχίζω) = σχίσσις, cleaving.

Before another liquid (λ, μ, ρ), ν is assimilated to the liquid; be-

fore a labial ( $\pi, \beta, \phi, \psi$ ), it becomes  $\mu$ ; before a palatal ( $\kappa, \gamma, \chi, \xi$ ), it changes to  $\gamma$ ; before  $\sigma$ , it is elided and the preceding vowel usually lengthens; before another  $\nu$ , it is usually retained.

*παλιμμήκης* (*πάλιν*), very long; *παλίλλυτος*, loosed again; *παλίρροια*, back water; *παλιμπλανής*, wandering to and fro; *σύμβλεμα* (*σύν*), seam; *σύμφυσις*, a growing together; *σύμψαλμα*, harmony; *παλίγκυρτος*, fishing net; *σύγγονος*, congenital; *σύγχροος*, of like color; *σιγξέω*, to smooth by scraping; *μέλανος*, *μελαν-ς* = *μέλας*; *δαίμονος*, *δαιμον-σι* = *δαίμοσι*; *γίγαντος*, *γιγαντ-ς* = *γίγας*.

*Σύν* drops its final before  $\sigma$  and a consonant, or before  $\zeta$ , but the  $\nu$  is simply assimilated before  $\sigma$  and a vowel.

*σύστημα*, system; *σίζωμα*, girdle

*συσσεισμός*, earthquake; *σύσσωμος*, united in one body

*Πάλιν* assimilates its  $\nu$  before  $\sigma$  and a vowel, and usually retains it before  $\sigma$  and a consonant; before another  $\nu$ , it is either dropped or retained.

*παλίσσυτος*, rushing back; *παλίνσκιος* or *παλίσκιος*, deeply shaded

*παλίνζωος*, living again; *παλίννοστος* or *παλίνοστος*, returning

*Αγαν* always drops  $\nu$ , except where doubling or assimilation takes place.

*ἀγάννιφος*, *ἀγάρροος*

*Εν* does not change its final before  $\rho$ ,  $\sigma$ , or  $\zeta$ .

*ἐνριζος*, rooted; *ἐνστασις*, plan; *ἐνζέννυμι*, to boil in

### *Doubling of Consonants*

(1) In word-formation, initial  $\rho$  is generally doubled when it follows a vowel, but remains single after a diphthong.

*διαρρωγή*, gap; *γλυκύρριζα*, sweet root; *εὐρρέων*, broad-flowing; *εὐρίζος*, well-rooted

(2) An aspirate is never doubled, but the corresponding surd takes the place of the first. *Σαπφώ* for *Σαφφώ*, etc.

(3) Doubling is a frequent phenomenon (mostly in verbs and comparatives) when the suffix *γα* ( $\iota$ ) follows the final consonant of root or stem; final  $\kappa, \gamma, \chi$ , and, rarely, other explosives, absorbing  $\iota$ , becoming  $\sigma\sigma$ ,  $\delta$  becomes  $\zeta\zeta$ , and  $\lambda$  becomes  $\lambda\lambda$ .



φυλάσσω (φυλακ-ι-ω), μείζων (μεγ-ι-ων), ἄλλος (ἀλ-ι-ος).

Metathesis, or transposition of this *ι* takes place when it follows final *ν* or *ρ*.

θεράπαινα = \*θεραπ-αν-γα = θεραπανια

σώτειρα = σωτηρ-ι-α

Syncope or elision of a vowel often occurs in the middle of a word.

πατρός for πατέρος

Contraction of vowels should be ignored, when an occasion for it might arise in forming scientific terms.

#### NOUN SUFFIXES

##### General

-μο- (-μος, m.) primary or secondary verbal oxytone: θυ-μός, heart; ἐρ-ισ-μός, strife

-μα- (-μη, f.), primary (or secondary?) verbal paroxytone: θερ-μη, heat

-ο- (-ος, -ον, m. or n.) chiefly primary: νομ-ός, pasture; λύκ-ος, wolf

-α- (-η, f.) chiefly primary: φυγ-ή, flight; ῥο-ή, stream; λεύκ-η, white poplar

-ι- (-ις, m. or f.) chiefly primary, paroxytone: πόλ-ις, city

-εν-, -ον- (-ην, -ων, m. or f.) primary or secondary, mostly verbal: ἄρσ-ην, male; εἰκ-ών, image, αἰ-ών, age

-μεν- (-μην, m.) primary oxytone: λι-μὴν, harbor

-μον- (-μων, m.) primary paroxytone: τέρ-μων, boundary

-μνο- (-μνον, n., -μνη, f.) primary, usually oxytone: στρω-μνή, bed

-ρο- (-ρος, m., -ρα, f., -ρον, n.) primary, mostly oxytone: ἔδ-ρα, seat, δῶ-ρον, gift

-λο- (-λος, m., -λη, f., -λον, n.) primary, mostly oxytone: φυ-λή, tribe; φῦ-λον, class. -ιλος, -ηλη, -ωλον, -ωλη, are widely extended false suffixes used after a consonant: they show the accretion of certain stem vowels.

-νο- (-νος, m., -νη, f., -νον, n.) primary, often oxytone: ὕπ-νος, sleep; ποι νή, penalty; τέκ-νον, child. An adventitious *α* has given the suffix -ανο- (-ανος, -ανη, -ανον, seen in: στέφ-ανος, crown; μηχ-ανή, device; δρέπ-ανον, scythe.

- νι- (-νις, f.,) primary: μῆ-νις, wrath
- το- (-τος, m., -τη, f.) primary, usually paroxytone: χόρ-τος, yard;  
κοί-τη, bed
- ατ- (-αρ, -ωρ, n.) primary: ἥπ-αρ, liver; ὕδ-ωρ, water
- ακ- (-αξ, m.) primary paroxytone: ῥύ-αξ, torrent; ἄρπ-αξ, robber
- αδ- (-ας, f.) primary or secondary, verbal or denominative, oxy-  
tone: λαμπ-άς, torch; ἐβδ-ομ-άς, week
- ιδ-, -ιθ- (-ις, f., rarely m.) primary or secondary, mostly oxytone  
when feminine, and paroxytone when masculine: ὄρν-ις,  
bird; κλε-ίς, key; παῖς, child; ἡμερ-ίς, oak with edible  
acorns; βασιλ-ίς, queen
- ιτ- (-ις, f., -ι, n.) primary paroxytone: χάρ-ις, grace; μέλ-ι,  
honey
- ωτ- (-ως, m.) primary paroxytone; γέλ-ως, laughter
- ω- (-ω, -ως, m. or f.) primary, feminine oxytone, masculine par-  
oxytone: ἦχ-ώ, sound; ἥρ-ως, warrior
- ερ- (-ηρ, m.) primary oxytone: αἶ-ήρ, atmosphere; αἰθ-ήρ, ether
- ορ- (-ορ, -ωρ, n.) primary paroxytone: ἄ-ορ, sword; πέλ-ωρ,  
prodigy

### Agent

- ην- (-εὺς, m.) primary, verbal or denominative, oxytone: γραφ-  
εὺς, writer
- εν- (-εὺς, m.) secondary denominative oxytone: γραμματ-εὺς,  
scribe
- τερ- (-τηρ, m., -τειρα, f.) primary or secondary verbal oxytone:  
λυ-τήρ, deliverer; νικ-η-τήρ, conqueror
- τορ- (-τωρ, m.,) primary or secondary verbal paroxytone: ῥή-τωρ,  
orator; νικ-ά-τωρ, conqueror
- τα- (-της, m.) primary oxytone or paroxytone: κρι-τής, judge  
Secondary (1) verbal, usually oxytone, with short primary  
vowel or sigma, ναι-έ-της, inhabitant, ἐρα-σ-τής, lover, or  
with long primary vowel, νικ-η-τής, conqueror, or with long  
primary vowel and sigma, ὄρχ-η-σ-τής, dancer; (2) denom-  
inative, generally paroxytone, οἰκ-έ-της, servant, δεσ-μώ-της,  
prisoner. From these words, the stem vowel has come to  
remain attached to the suffix, giving the agent suffixes,  
-ιτης, -είτης, -ώτης, ιώτης.

*Means or Instrument*

- τρο-** (-τρος, m., -τρα, f., -τρον, n.) primary or secondary verbal, feminine and neuter usually paroxytone: *δα-τρός*, knife; *ρή-τρα*, agreement; *βάκ-τρον*, staff; *ἄρ-ο-τρον*, plough
- τλο-** (-τλος, m., -τλον, n.) primary, usually paroxytone: *ἄν-τλος*, bucket; *χύ-τλον*, liquid
- (-τλη, f.) secondary verbal, usually paroxytone: *ἐχέ-τλη*, handle
- θρο-** (-θρον, n.) primary, usually paroxytone: *ἄρ-θρον*, joint
- (-θρα, f.) secondary verbal, usually paroxytone: *κοι-μή-θρα*, chamber
- θλο-** (-θλη, f., -θλον, n.) primary (or secondary?) paroxytone: *θύς-θλον*, sacred implement; *γενέ-θλη*, race
- κο-** (-κη, f.) primary paroxytone: *θή-κη*, box
- ευ-** (εὐς, m.) secondary verbal or denominative oxytone: *ἀμελγ-εὐς*, milkpail

*Result*

- ματ-** (-μα, n.) primary or secondary, verbal (secondary rarely denominative) accent recessive: *φράγ-μα*, palisade; *σῶ-μα*, body; *δή-λη-μα*, bane
- ες-** (-ος, n.) primary, mostly paroxytone: *βέλ-ος*, dart; *ἐλ-ος*, marsh

*Place*

- τηριο-** (-τήριον, n.) primary or secondary verbal proparoxytone: *δικασ-τήριον*, court house
- ειο-** (-εῖον, n.) primary or secondary denominative paroxytone: *ψιλ-εῖον*, prairie
- ων-** (-ων, m.) primary or secondary denominative oxytone: *ἀμπελ-ών*, vineyard
- τρα-** (-τρα, f.) primary or secondary verbal paroxytone: *παλαί-σ-τρα*, place for wrestling

*Action*

- τι-** (-τις, f.) primary verbal, usually paroxytone: *φά-τις*, speech
- σι-** (-σις, f.) primary or secondary verbal, usually paroxytone: *φύ-σις*, nature; *ἀφάν-ι-σις*, disappearance
- σια-** (-σια, f.) usually secondary verbal paroxytone: *δοκιμα-σία*, testing



*Quality*

- ια- (-ια, f.) primary or secondary denominative, mostly paroxytone: ἁρμον-ία, harmony
- ος-, -ες- (-ως, m. or f.) primary oxytone: ἡ-ώς, dawn  
(-ος, n.) primary recessive: βάρ-ος, weight, ξρευθ-ος, redness
- τητ- (-της, f.) secondary denominative paroxytone: λεπτ-ό-της, thinness; whence -οτητ- (-ότης, f.) παντ-ότης, universality
- συννα- (-συνη, f.) secondary denominative paroxytone: σωφρο-σύνη, prudence

*State or Object*

- δον- (-δων, f.) secondary verbal oxytone: ἀλγ-η-δών, suffering
- μονο- (-μονη, f.) primary verbal oxytone: χαρ-μονή, joy
- τυ- (-τυς, f., -τυ, n.) primary: βρω-τύς, meat; ἄσ-τυ, town
- υθ-, -υθ- (-υς, f.) primary, often oxytone: χλαμ-ύς, cloak

*Diminutives*

- ιο- (-ιον, n.) primary or secondary denominative paroxytone: σπορ-ίον, little spore. Various suffixes of stems have become attached to this diminutive, giving the common diminutive suffixes, -αριον, -ιδιον, -υδριον, -υλλιον, -υφιον, all forming neuter proparoxytones.
- ισκο- (-ισκος, m., -ισκη, f.) primary or secondary denominative paroxytone: νεαν-ίσκος, youth; παιδ-ίσκη, little girl. This suffix sometimes combines with -ιον to form a suffix -ισκιον, neuter proparoxytone; ἄσπιδ-ίσκιον, small shield.

*Patronymics*

- δᾱ- (-δης, m.) secondary denominative paroxytone
- δ- (-ς (δς) f.) secondary denominative oxytone  
Stems of the first declension add the suffix directly: Βορεά-δης, son of Boreas; Βορεά-ς, daughter of Boreas.  
Stems of the second declension replace ο of the stem with ι: Πριαμ-ίδης, son of Priam; Πριαμ-ίς, daughter of Priam. Those in -ιο, however, change ο to α, giving the suffixes -ιάδης and -ιάς.  
Stems of the third declension insert ι before the suffix, ευ dropping the υ before ι: Κεκροπ-ίδης, a son of Cecrops; Κεκροπ-ίς, daughter of Cecrops.

## ADJECTIVE SUFFIXES

*General*

- ēs*- (-*ης*, m., f., -*ēs*, n.) primary, rarely secondary denominative oxytones: *ψενδ-ής*, false; *εὖγεν-ής*, well-born; *λιπ-αρ-ής*, persistent
- o*-, -*a*- (-*os*, m., -*η*, -*a*, -*os*, f., -*ov*, n.) primary or secondary (denominative when secondary) always oxytone, except in compounds: *ψιλ-ός*, *ή*, *όν*, bare; *ξηρ-ός*, *ά*, *όν*, dry; *βού-νομος*, *ov*, grazed by cattle
- ad*- (-*as*, m., f.) primary oxytone: *σπορ-άς*, scattered; *λογ-άς*, selected
- id*- (-*is*, f.) secondary denominative oxytone, feminines of nouns or adjectives, most having become substantives: *Δελφ-ίς*, Delphian

*Ownership or Relation*

- io*- (-*ios*, -*ia*, -*ion*) primary denominative proparoxytone: *στύγ-ιος*, hateful: secondary denominative; (1) the stem vowel may be elided before *i*, as *θαλάσσι-ος*, marine, from *θάλασσα*, or (2) it may be retained, as *δίκαι-ιος*, just, *ὅμο-ιος*, similar, whence arise new forms of the same suffix, i.e., -*aios*, -*oios*, -*eios*, *φος*, etc.
- sio*- (-*sios*) arose from adding -*io*- to stems in -*ti*, but is now regularly used as a suffix; *θανμά-σιος*, wonderful.
- idio*- (-*idios*) arose from attaching -*io*- to stems in -*id*-, but has become a regular suffix (especially frequent in the neuter to form diminutives): *θαλασσ-ίδιος*, marine.
- ko*- (-*kos*, *η*, *ov*) secondary denominative oxytone: *φυνσι-κός*, natural: whence has probably come -*iko*- (-*ikós*), *πολεμ-ικός*, warlike, *δερ-ματ-ικός*, cutaneous; whence -*tiko*- (-*tikós*), especially applied to nouns of agent in -*της*. The addition of -*κός* to stems in -*ia* has given the suffixes -*iakós*, and -*akós*; to stems in -*v*, -*vkós*.

*Material*

- ino*- (-*no*-) (-*inos*, *η*, *ov*) primary or secondary denominative proparoxytone: *δρύ-ινος*, oaken; *ξύ-λ-ινος*, wooden

The modification of the initial vowel of the suffix has pro-

duced the suffix -ηνο- (-ηνος), which is a secondary verbal oxytone, *πετ-ε-ηνός*, winged.

-ιο- (-εος, -εα, -εον) secondary denominative proparoxytone: the nominative form arose from primary stems in -ε, and the intervocalic ι was then elided, *ἀργυρε-ιο-ς* = *ἀργύρεος*, silver; *μολύβδ-εος*, leaden.

-ινεο- (-ινεος) secondary denominative paroxytone: formed by adding -ιο to -ινο; *φηγ-ινέος*, oaken.

### Quality

-μο- (-μος) primary oxytone: *θερ-μός*, hot. The addition of this suffix to stems in -τι, *δρα-σι-μός*, active, has produced a secondary denominative suffix -ιμος, *ἐδ-ώδ-ιμος*, eatable, and this, by further combination, has given -άλιμος, *εἰδ ἀλιμος*, beautiful.

-ρο- (-ρος) primary, nearly always oxytone: *λαμπ-ρός*, bright; *ἐρυθ-ρός*, red: secondary, mostly denominative, usually oxytone: *φαν-ε-ρός*, plain, whence the suffix -ηρος; *κυματ-ηρός*, billowy.

-λο- (-λος) primary, nearly always oxytone: *δει-λός*, timid. Secondary denominative oxytone: *σιγ-η-λός*, silent, whence the suffixes -ηλός, -ωλός, etc.; *ἀπαπ-ηλός*, deceitful; *ἁμαρτ-ωλός*, used to sin.

### Fulness

-εντ- (-εις, -εσσα, -εν) secondary denominative, usually paroxytone, the feminine proparoxytone: *χαρί-εις*, graceful; *πτερό-εις*, winged, whence the suffixes, -όεις, -ήεις; *σκι-όεις*, shady, *δενδρ-ήεις*, woody.

-νο- (-νος) primary oxytone: *σεμ-νός*, holy

-ινο- (-ινος) primary and secondary oxytone: *πεδ-ινός*, quite level; *ὄρ-ε-ινός*, mountainous, whence -εινός; *εὐδι-εινός*, quite cheerful.

-ρι- (-ρις) primary paroxytone, *ἔδ-ρις*, skilful

-αλεο- (-αλεος) secondary paroxytone: *ρομ-αλέος*, strong; *ψωρ-αλέος*, itchy

-μον- (-μων, -μων) primary, usually paroxytone: *ἔδ-μων*, skilful

### Ability or Fitness

-ικο- (-ικος) secondary verbal oxytone: *γραφ-ικός*, able to write; *ἀρχ-ικός*, fit to rule



- τικο- (-τικός) secondary verbal oxytone: *πρακ-τικός*, practical
- ιμο- (-ιμος) primary or secondary, mostly verbal, proparoxytone:  
*πότ-ιμος*, drinkable; *θανά-σ-ιμος*, deadly, hence -σιμος?
- ιμαιο- (-ιμαίος), *ὑποβολ-ιμαίος*, spurious

### Time

- ινο- (-ινος) usually secondary, denominative oxytone: *ἡμερ-ινός*, of day; *ὄπωρ -ινός* of late summer; *χθες-ινός*, of yesterday

### Likeness

- ωδε- (-ώδης, m., f., -ῶδες, n.) secondary denominative paroxytone, arising from *εἶδος*, *τό*, form, in composition as the last term, whence the form -οειδής, and, by contraction, -ώδης; *λίμν -ώδης*, like a marsh, marshy. This suffix is often used to indicate fulness, also.

### Verbal: Capability or Obligation

- το- (-τος) primary or secondary verbal oxytone: *σχισ-τός*, split; *κλυ-τός*, renowned; *φιλ-η-τός*, loved
- τεο- (-τεος) secondary verbal paroxytone: *φιλ-η-τέος*, lovable

## COMPOSITION

Greek exhibits two types of composition, syntactic and non-syntactic. Syntactic composition is the union under a single accent of two words, one being merely a modifier of the other and in the case demanded by this relation. Such forms arise often from juxtaposition, for reasons of convenience, and are not, properly speaking, compounds, e. g., *κυνός-βατος*, dog thorn (*κύων*, *κυνός*, dog), *μυνο-ωτίς*, mouse ear (*μῦς*, *μυός*, mouse). The subordinate word is usually in the genitive, though, rarely, it may occur in practically any case. In non-syntactic composition, the two terms of the compound are morphologically coordinate, though the one is usually subordinated to the other in meaning. The second word is attached to the stem of the first in the same way that secondary suffixes are added to stems, with the very important exception that the final vowel of the first member has become a universal thematic vowel, or connective, e.g., *μακρο-σπορα*, *κορυνη-φορα*. Non-syntactic composition is the only real composition. It is so overwhelmingly predominant in Greek that it

alone needs to be taken into account. Indeed, syntactic composition must be sedulously avoided by biologists, if confusion is to be prevented, and the few syntactic compounds already in existence in nomenclature should be made to conform to the rules for non-syntactic composition.

Compound words consist of three elements, the first term, the connecting vowel, and the last term. For reasons of convenience, the last term will be considered first, then the connective, and, finally, under the first term, will be given a detailed exposition of composition in the different classes of words.

#### THE LAST TERM

The last term is always a nominal stem, i. e., noun, adjective, or verbal adjective. The form of the last term is necessarily determined by its character, as follows:

I. If the last term is a noun, it may (1) stand without change, and the resulting compound is properly a substantive, though Greek often employs such words as adjectives, or (2) it may take adjectival endings, according to its declension, and the resulting compound is an adjective. Again, in Greek, practically all compound adjectives may be used as substantives.

II. If the last term is an adjective or verbal adjective, it may stand without change in the resulting compound, but usually it becomes an adjective of two terminations (-ος, m., f., -ον, n., rarely, -ης, m., f., -εις, n.). The adjective may take substantive suffixes, in which case the compound will, of course, be a noun.

The following examples will illustrate the form of the last term and the character of the resulting compound.

I.1. The last term is a noun, undergoing no change.<sup>1</sup>

ποδο-σπορα, ἡ (ποῦς, ποδός, ὁ, foot, σπορά, ἡ, seed) foot-spore  
 αἱματο-κοκκος, ὁ (αἷμα, αἵματος, τό, blood, κόκκος, ὁ, berry) blood-  
 berry  
 ὄφιο-σταφυλή, ἡ (ὄφις, ὄφις, ὄφεως, ὁ, snake, σταφυλή, ἡ, bunch  
 of grapes) briony

<sup>1</sup> For accent of compounds, see Buttmann, 292.

ξίφο-θηκη, ἡ (ξίφος, ξίφεος, τό, sword, θήκη, ἡ, box) scabbard  
 περι-βλημα, τό (περί, around, βλήμα, βλήματος, τό, throw)  
 covering

μικρο-καλύβη, ἡ (μικρός, small, καλύβη, ἡ, hut) small hut.

I.2. The last term is a noun, changed to an adjective, usually by a suffix. The various changes of the noun depend upon its declension to a large extent.<sup>1</sup>

a. If the final term is a noun of the first or second declension (stem in -a or -o, nominative, -ης, -ας, -ος, masculine, -η, -α, -ος, fem., -ον, neut.) the compound adjective will terminate in -ος, masc. and fem., -ον, neut.

εὖ-τοξοτ-ος, -ον (εὖ, good, τοξότης, ὁ, archer) with good archers  
 καλλι-νεανι-ος (κάλλι-, beautiful, νεανίας, ὁ, youth) beautifully  
 youthful

πολυ-λογ-ος (πολύς, much, λόγος, ὁ, word) talkative

λευκο-κομ-ος (λευκός, white, κόμη, ἡ, hair) white-haired

εὐρυ-χωρ-ος (εὐρύς, broad, χώρα, ἡ, space) roomy

τραχυ-οδ-ος (τραχύς, rough, ὁδος, ἡ, road) with rough roads

βαθυ-φυλλ-ος (βαθύς, thick, φύλλον, τό, leaf) thick-leaved, leafy

b. If the final term is a noun of the third declension with the stem in any consonant except ν, ρ, δ, or -ες, the compound adjective ends in -ος, -ον.

μελανο-φλεβ-ος (μέλας, μέλανος, black, φλέψ, φλεβός, ἡ, vein)  
 black-veined

μικρο-μαστιγ-ος (μικρός, short, μάστιξ, μάστιγος, ἡ, whip) short-  
 ciliate

πολυ-ορνιθ-ος (πολύς, many, ὄρνις, ὄρνιθος, ὁ, ἡ, bird) abounding  
 in birds

πυκνο-σαρκ-ος (πυκνός, thick, σάρξ, σαρκός, ἡ, flesh) with firm  
 flesh

ἀ-σωματ-ος (ἀ-, without, σῶμα, σώματος, τό, body) incorporeal

χρυσο-στομ-ος (χρύσεος, golden, στόμα, στόματος, τό, mouth)  
 golden-mouthed

<sup>1</sup> This account has been largely based upon Miller, *Scientific Names of Latin and Greek Derivation*, 134.



- c. If the final term is a noun of the third declension with the stem in *ν*, *ρ*, or *δ* (nom. *σ*), the compound retains this form, i. e., it is properly a noun used adjectively. Sometimes the noun is inflected in two genders, e. g., *-ων*, *-ον*, or *-ωρ*, *-ορ*, or, more rarely, it takes the adjective termination, *-ος*, *-ον*.

μακρο-χειρ (μακρός, long, χείρ, χειρός, ἡ, hand) long-armed  
 αὐτο-χθων, ον (αὐτός, self, χθών, χθονός, ἡ, ground) native  
 αὐτο-χθον-ος, ον, country and all  
 σκληρο-πους (σκληρός, hard, ποῦς, ποδός, m., foot) hard-footed  
 κακο-πους, -πουν (κακός, bad, ποῦς, ποδός, m., foot) with bad feet

- d. If the final term is a noun of the third declension with the stem in *-ες* (gen. *-εος*, nom. *-ης*, m. f. *-ος*, n.), the compound adjective will terminate in *-ης*, masc. and fem., *-ες*, neut.

θεο-γενης, es (θεός, ὁ, God, γένος, γένεος, τό, race) born of God  
 τειχο-μελης (τείχος, τείχεος, τό, wall, μέλος, μέλεος, τό, music)  
 walling by music

πολυ-ανθης (πολύς, much, ἄνθος, ἄνθεος, τό, flower) blossoming

- e. If the final term is a neuter noun of the third declension with the stem in *-ατ*, nom. *-ας*, the compound adjective as a rule ends in *-ως* (contraction of *-αος* for *-ατος*) masc. and fem., *-ων* neut., or, rarely, in *-ος*, *-ον*.

μεγαλο-κερ-ως, ων (μέγας, μεγάλον, large, κέρας, κέρατος, τό, horn)  
 large-horned

πολυ-τερ-ως (πολύς, much, τέρας, τέρατος, τό, wonder) full of wonder

μονο-κερατ-ος (μόνος, single, κέρας, τό, horn) with one horn

ὀρθο-κερ-ος, ον (ὀρθός, upright, κέρας, τό, horn) with upright horns

γλυκυ-κρε-ος (γλυκύς, sweet, κρέας, κρέως (κρέατος) τό, meat)  
 sweet-meated

- f. If the final term is a noun of the third declension with the stem in the vowel *ι*, or *υ* (*-ις*, *-υς*, nom. m., f., *-ι*, *-υ*, neut.), it retains this form; rarely it terminates in *-ος*, *-ον*.

πολυ-ιχθυσ (πολύς, many, ἰχθύς, ἰχθύος, ὁ, fish) abounding in fish; also πολυ-ιχθυ-ος, ον

πυκνο-δρυσ (πυκνός, thick, δρύς, δρύνος, ἡ, oak) beset with oaks  
 μελαν-δρυ-ος, ον (μέλας, μέλανος, black, δρύς, oak) dark with oak  
 leaves

χρυσ-οψις (χρύσεος, golden, ὄψις, ὄψεως, ἡ, appearance) looking  
 like gold

φυγο-πολις (φύγος, fleeing, πόλις, πόλεως, ἡ, city) fleeing from a  
 city

- II.1. If the last term is an adjective, the compound usually becomes an adjective of two terminations, -ος, -ον; rarely, there is no change. In case it is used substantively, it may appear in any gender at the coiner's pleasure. The compound may, moreover, pass into a noun by the addition of a substantive suffix.

στενο-μακρος, ον (στενός, narrow, μακρός, long) long and narrow  
 μελανο-φαιος, ον (μέλας, μέλανος, black, φαιός, dusky) dark gray  
 λευκο-ερυθρος, ον (λευκός, white, ἐρυθρός, red) whitish red  
 ἑτερο-γλανκος, ον (ἕτερος, different, γλανκός, gray) with one eye  
 gray

λευκο-μελας, αινα, αν (λευκός, white, μέλας, black) whitish black  
 ὀξύ-γλυκυσ, εια, υ (ὀξύς, sour, γλυκός, sweet) sourish sweet  
 ἑτερο-φων-ια (ἑτερό-φωνος, of different voice) difference of tone  
 ζηλημο-συννη (ζηλήμων, jealous) jealousy

- II.2. If the last term is a verbal adjective (in -ος, -τος, or -τεος), it may retain the active ending, -ος, -ον, or the passive ending, -τος, or -ης, -ες, may be substituted for either.

δια-στροφ-ος, ον (διαστρέφω, to twist about) twisted  
 περι-τροπ-ος (περιτρέπω, to turn round) turned round  
 περι-φερ-ης, ες (περιφέρω, to carry round) revolving  
 δυσ-μαθ-ης (δυσμαθέω, to be slow in learning) hard to learn  
 δυσ-τακ-τος, ον (τάσσω, to arrange) disordered, irregular  
 ἀ-λεπιδω-τος (λεπιδόμυ, to be scaly) not covered with scales

#### THE CONNECTIVE (THEMATIC VOWEL)

The connective in Greek compounds was originally the final vowel of the stem, or, in imparisyllabics, the vowel of the genitive. The connective -ο- was originally, then, characteristic of

nouns of the second declension, and of many stems of the third. By analogy, it spread to stems of the first declension, and the remaining stems of the third, and, finally, even to verbal stems. The overwhelming predominance of the connective *-o-* makes it advisable to disregard the use of the thematic vowel of each declension as a connective in making new compounds, and may be considered sufficient warrant for its insertion in compounds already constructed upon the basis of another thematic connective. Such duplicates as *Corynephorus* and *Corynophorus* should be avoided for the sake of uniformity in spelling, if for no other reason, but when they are the names of different genera, as in the present case, they are altogether unfortunate. Moreover, alternative connectives of this sort will always furnish occasion for similar blunders on the part of those not thoroughly conversant with the principles of Greek word-formation. The connectives which may be properly used with the different classes of first terms of compound words are shown in the following list of examples. The diversity of classical usage in this matter is a cogent argument for the use of *-o-* as a connective in all cases where the first term is a nominal stem, if not, indeed, everywhere that a connective is required.

1. First declension: stem in *-a*, nom.; *-a*, *-η*, fem.; *-ας*, *-ης*, masc.  
*θαλασσ(α)-ο-φυλλον* (θάλασσα, ἡ, sea, φύλλον, τό, leaf) *Thalassophyllum*  
*κεφαλ(η)-ο-στιγμα* (κεφαλή, ἡ, head, στίγμα, τό, mark) *Cephalostigma*  
*σκια-φιλη* (σκιά, ἡ, shadow, φίλος, loved) *Sciaphile*  
*θηλη-φορα* (θηλή, ἡ, nipple, φορά, ἡ, carrying) *Thelephora*  
*κλεπτ(η)-ο-φυτον* (κλέπτῃς, ὁ, thief, φυτόν, τό, plant) *Cleptophytum*
2. Second declension: stem in *-o*, nom., *-ος*, masc. and fem., *-ον*, neut.  
*ἄσκο-λεπις* (ἄσκος, ὁ, leathern bag, λεπίς, ἡ, scale) *Ascolepis*  
*ῥαβδο-κρινον* (ῥάβδος, ἡ, rod, κρίνον, τό, lily) *Rhabdocrinum*  
*βαλαν(ο)-η-φορος* (βάλανος, ἡ, acorn, φορός, carrying) *Balanophorus*  
*ῥοδο-δενδρον* (ῥόδον, τό, rose, δένδρον, τό, tree) *Rhododendrum*



## 3. Third declension:

(a) Stem extending in an explosive, i.e., any consonant except σ, μ, ν, λ, ρ, or -ματ.

ράδικο-φυλλον (ράδιξ, ράδικος, ἡ, branch, φύλλον, τό, leaf) Rhad-  
icophyllum

κηλιδ(ο)-ανθος (κηλῖς, κηλῖδος, ἡ, spot, ἄνθος, τό, flower) Celi-  
danthus.

κεράτο-στομα (κέρας, κέρατος, τό, horn, στόμα, τό, mouth) Cerato-  
stoma

ἀσπιδ(ο)-η-φορος (ἀσπίς, ἀσπίδος, ἡ, round shield, φορός, bearing)  
shield bearing

κερας-φορος (κέρας, τό, horn, φορός, bearing) bearing horns

μελι-κοκκος (μέλι, μέλιτος, τό, honey, κόκκος, ό, berry) Melicoccus

αἰ-πολος (αἶξ, αἰγός, ό, ἡ, goat, -πολός (-κολέω, dwell) goat-herd

(b) Stem ending in a nasal or a liquid (ν, λ, ρ).

ἄκτινο-στροβος (ἄκτις, ἀκτῖνος, ἡ, ray, στρόβος, ό, whirling) Ac-  
tinostrobos

δαιμονο-ρωψ (δαίμων, δαίμονος, ό, divinity, ῥώψ, ἡ, bush) Dae-  
monorops

θιν(ο)-ανθη (θίς, θινός, ό, ἡ, heap, dune, ἄνθη, ἡ, bloom) Thin-  
anthe

ἄκμο-θετον (ἄκμων, ἄκμονος, ό, anvil, θετός, placed) anvil-block

ἅλο-σταχυς (ἅλς, ἅλς, ἡ, sea, στάχυς, ό, spike) Halostachys

ἅλι-θριδαξ (ἅλς, ἡ, sea, θρίδαξ, ἡ, lettuce) Halithridax

θηρο-φονον (θήρ, θηρός, ό, beast, φονός, slaying) Therophonum

γαστρο-χειλος (γαστήρ, γαστρός (-έρος), ἡ, belly, χεῖλος, τό, lip)  
Gastrochilus

γαστερ(ο)-ανθος (γαστήρ, ἡ, belly, ἄνθος, τό, flower) Gasteranthus

πυρ-φορον (πῦρ, πυρός, τό, fire, φορός, bearing) Pyrphorum

πυρι-φλογος (πῦρ, τό, fire, φλογός, blazing) flaming with fire

(c) Stem ending in -ματ-, nom., -μα, neuters

γραμματο-θηκη (γράμμα, γράμματος, τό, line, θήκη, ἡ, box) Gram-  
matotheca

δερματο-βλαστος (δέρμα, δέρματος, τό, skin, βλαστός ό, sprout)  
Dermatoblastus

φυματο-στρωμα (φύμα, φύματος, τό, tumor, στρῶμα, τό, bed)  
Phymatostroma

στομ(ο)-αρρηνα (στόμα, στόματος, τό, mouth, ἄρρην, ἄρρεν, male)  
Stomarrhena

στομα-λίμνη (στόμα, τό, mouth, λίμνη, ἡ, lake) salt water lake  
(d) Stem ending in -ες; nom., -ος, -ης, gen., -εος, mostly neuters.

βело-στεμμα (βέλος, βέλεος, τό, dart, στέμμα, τό, wreath) Belos-temma

έλο-φυτον (ἔλος, ἔλεος, τό, marsh, φυτόν, τό, plant) Helophytum

όρο-φακη (όρος, όρεος, τό, mountain, φακῇ, ἡ, lentil) Orophace

όρεο-δόξα (όρος, τό, mountain, δόξα, ἡ, glory) Oreodoxa

όρες-βιος (όρος, τό, mountain, βίός, living) living in the mountains

όρεσι-τροφος (όρος, τό, mountain, τροφός, nurtured) mountain-nurtured

όρε-σκιος (όρος, τό, mountain, σκίός, shadowed) over-shadowed by mountains

ξιφ-η-φορος (ξίφος, ξίφεος, τό, sword, φορός, bearing) armed with the sword

βελε-η-φορος (βέλος, βέλεος, τό, arrow, φορός, bearing) bearing arrows

(e) Stem ending in -ι or -υ; nom., -ις, -υς, masc., fem., -ι, -υ, neut.

παλιο-δενδρον (πόλις, πόλιος, πόλεως, ἡ, city, δένδρον, τό, tree)  
Poliodendrum

πολια-νομος (πόλις, ἡ, city, νομός, dealing out) civic magistrate

πολι-πορθος (πόλις, ἡ, city, πορθός, destroying) destroyer of cities

τιγρο-ειδης (τίγρης, τίγρις, ἡ, tiger, εἶδος, τό, form) spotted

όφιο-σκοροδον (όφεις, όφιος, όφεως, ό, snake, σκόροδον, τό, garlic,  
Ophioscorodum

διο-πολος (όις, όϊος, ό, ἡ, sheep, -πολός (-κολέω, dwell) shepherd

ιχθυο-μεθη (ιχθύς, ιχθύος, ό, fish, μέθη, ἡ, strong drink) Ichthyomethe

νεκυο-στολος (νέκυσ, νέκυος, ό, dead body, στολός, ferrying) ferrying the dead

νεκυ-η-πολος (νέκυσ, ό, dead body, -πολός, dwelling among) having to do with the dead

βοτρυ-φορος (βότρυς, βότρυνος, ό, cluster of grapes, φορός, bearing) bearing grapes

βου-πλευρον (βοϋς, βοός, ό, ἡ, ox, πλευρόν, τό, rib) Bupleurum

4. Verbal stems. When the first term is a verbal stem, it enters into composition with a thematic  $-\epsilon$  (the form of the second person singular present imperative of  $-\omega$  verbs), or with a sigmatic stem,  $-\sigma\iota$ , resembling the sigmatic stem of aorists. The influence of analogy has been felt here also, in that both connectives occasionally yield to the  $-\sigma$  of noun stems, and, more rarely,  $\epsilon$  and  $\iota$  of the verbal stems interchange or assimilate.

φερε-βοτρυς (φέρω, bear, βότρυς, βότρυος, ὅ, bunch of grapes) bearing bunches of grapes

λυσι-θριξ (λύω, loose, θρίξ, τριχός, ἡ, hair) with loose hair

φερεσ-βιος (φέρω, bear, βίος, ὁ, life) bearing life

περσε-φονη (φέρω, bear, φονή, ἡ, death) Persephone, bringer of death

περσε-πολις (πέρθω, destroy, πόλις, ἡ, city) sacker of cities

ἀρχι-θαλασσοσ (ἄρχω, rule, θάλασσα, ἡ, sea) ruling the sea

λιπο-σκιος (λείπω, leave, σκιά, ἡ, shade) shadowless

ῥυπο-κινδυνος (ρίπτω, throw, κίνδυνος, ὁ, risk) venturesome

#### THE FIRST TERM

The first term of a compound may be a nominal stem (noun, pronoun, or adjective), an indeclinable particle (adverb, preposition, or inseparable particle), or a verbal stem. The form of the first term will be that of its stem if this ends in  $-\sigma$ ; if the stem ends in  $-\alpha$ ,  $-\sigma$  will be substituted as the connective, and if it ends in  $-\iota$ ,  $-\upsilon$ , or a consonant,  $-\sigma$  will be added as a connective. The connective is omitted in the case of an indeclinable particle, and it is regularly elided before an initial vowel of the last term. In the following examples intended to show the form in which first terms of various categories should enter into composition, the effect of analogy is extended over all first terms of compound words which take a connective, with the exception of adjectives in  $-\upsilon\varsigma$ ,  $-\epsilon\iota\alpha$ ,  $-\upsilon$ , and verbal stems. Its use might well be extended to verbals upon the analogy of λείπω, which regularly enters into composition in the form, λιπο-, but verbal first terms are rare in scientific compounds, and are rather to be discouraged on account of the alternatives to which they are certain to give rise.



From the standpoint of the biologist, the application of the connective -o- might well have been made universal, but in the case of adjectives in -vs, the use of the thematic -v as connective is so invariable that the addition of an -o, as it is found in noun stems of the same sort, was felt to be unwarranted.

# I. Nouns.

1. First declension; nominative singular feminine, -α, -η; masculine, -ας, -ης. The stems of this declension are all originally in -α, which is often modified into -η. In feminines, the stem is identical with the nominative singular; in masculines, the stem is obtained by dropping the termination, -σ, of the nominative.<sup>1</sup>

πετρ(α)-ο-φιλη (πέτρα, ἡ, rock, φίλος, loved, loving) Petrophile  
 ἡμερ(α)-(ο)-ανθος (ἡμέρα, ἡ, day, ἄθος, τό, flower) hemeranthus,  
 -um 25

μαχαρ(α)-(ο)-ανθηρα (μάχαιρα, ἡ, dagger, ἄνθηρός, flowery)  
 Machaerantha 8

ζων(η)-ο-θρίξ (ζώνη, ἡ, girdle, θρίξ, ἡ, hair) Zonothrix 2

βορε(α)-ο-φυτον (βορέας, ὁ, north wind, φυτόν, τό, plant) Boreo-  
 phytum

ἵπποτ(η)-ο-φυλλον (ἵππότης, ὁ, horseman, φύλλον, τό, leaf) Hip-  
 potophyllum

γεω-πυξίς (γῆ, γέα, ἡ, earth, πυξίς, ἡ, box) Geopyxis 38: γεο-, 1;  
 9 in γη-

2. Second declension. The stems of this declension terminate in -ο, rarely in -ω, and are obtained for composition by dropping σ of the nom. sing. of masc. and fem. and ν of the neuter.

βιο-φυτον (βίος, ὁ, life, φυτόν, τό, plant) Biophytum 43

ζεφυρ(ο)-ανθος (ζέφυρος, ὁ, west wind, ἄθος, τό, flower) Zephyr-  
 anthus

ποταμο-γειτων (ποταμός, ὁ, river, γείτων, ὁ, ἡ, neighbor) Potamo-  
 giton 18

δροσο φορος (δρόσος, ἡ, dew, φορός, bearing) Drosophorus 8

<sup>1</sup> The first number after a compound indicates the number of times the proper stem is found in composition in the Greek lexicon as the first term. Other numbers indicate the frequency of alternatives.

ὑαλο-σειρα (ὑαλος, ἡ, glass, σείρα, ἡ, band) Hyalosira 7

φηγο-πτερις (φηγός, ἡ, beech, πτερίς, ἡ, fern) Phegopteris 1

ἱματι(ο)-ανθος (ἱμάτιον, τό, outer garment, ἄνθος, τό, flower)

Himatianthus 12

ιο-δραβη (ἰον, τό, violet, δράβη, ἡ, sort of mustard) Iodrabe 4

συκο-μορφη (σῦκον, τό, fig, μορφή, ἡ, form) Sycomorphe 18

ὀστο-θηκη (ὀστέον, ὀστούν, τό, bone, θήκη, ἡ, box) place for bones  
20; ὀστεο-, 6

λαγω-χειλος (λαγώς, ὁ, hare, χείλος, τό, lip) Lagochilus 20;  
λαγο-, 6

τα(ω)-ουρα (ταῦς, ὁ, peacock, οὐρά, ἡ, tail) Taūra

3. Third declension. These may be either consonant or vowel stems. The stem is derived most readily by dropping the ending, -ος, of the genitive singular.

#### A. Consonant stems.

(1) Stem ending in an explosive, i.e., any consonant except σ, μ, ν, λ, ρ, and τ in -ματ, nom. -μα; nominative singular ending in a double consonant, ψ or ξ, or in σ.

(a) Stem in a labial, π, β, φ; nominative in ψ (labial + σ).

ῥιπ-ο-γονατιον (ῥύψ, ῥιπός, ἡ, rush, γονάτιον, τό, small joint) Rhipogonatum

φλεβ-ο-χιτων (φλέψ, φλεβός, ἡ, vein, χιτών, ὁ, frock) Phlebochiton 13

κατηλιφ-ο-μορφη (κατήλιψ, κατήλιφος, ἡ, ladder, μορφή, ἡ, form) Cateliphomorphe

(b) Stem in a palatal, κ, γ, χ; nominative in ξ (palatal + σ).

άλωπεκ-(ο)-ουρος (άλώπεξ, αλώπεκος, ἡ, fox, οὐρά, ἡ, tail) Alopecurus 1

φλογ-(ο)-ακανθος (φλόξ, φλογός, ἡ, flame, ἄκανθος, ὁ, spiny plant) Phlogacanthus 14

ὄνυχ-ο-πεταλον (ὄνυξ, ὄνυχος, ὁ, claw, πέταλον, τό, leaf) Onychopetalum 2

(c) Stem in a dental, τ, δ, θ, or ντ, νθ, κτ; nominative in σ, rarely in ρ

φωτ-ο-φοβος (φώς, φωτός, τό, light, φοβός, fearing) Photophobus 27:1

ἱμαντ-ο-χαιτη (ἱμάς, ἱμάντος, ὁ, thong, χίτη, ἡ, long hair) Himantochaete 10

ὀδοντ-ο-κύκλος (ὀδοῦς, ὀδόντος, ὁ, tooth, κύκλος, ὁ, ring) Odontocyclus 18

νυκτ-ο-μυκης (νύξ, νυκτός, ἡ, night, μῦκης, ὁ, mushroom) Nyctomyces 28:33 in νυκτι-

κερατ-ο-στῦλις (κέρας, κέρατος, τό, horn, στῦλις, ἡ, pillar) Ceratostylis 16:3

στεατ-(ο)-οπία (στέαρ, στέατος, τό, tallow, ὀπός, ὁ, juice) Steatopia 3

ὑδατ-ο-φορά (ὔδωρ, ὕδατος, τό, water, φορά, ἡ, a carrying) Hydatophora 22

κλειδ-ο-νήμα (κλείς, κλειδός, ἡ, key, hook, νῆμα, τό, thread) Clidonema 6

χλαμυδ-ο-μονάς (χλαμύς, χλαμύδος, ἡ, mantle, μονάς, ἡ, unit) Chlamydomonas 8

κορυθ-(ο)-αιολον (κόρυς, κόρυθος, ἡ, helm, αἰόλος, nimble) Corythaeolum

ἐλμινθ-ο-στάχυς (ἐλμινς, ἐλμινθος, ἡ, worm, στάχυς, ὁ, spike) Helminthostachys 2

(2) Stem ending in a liquid, ν, λ, ρ; nominative in the same consonant, or σ.

(a) Stem in ν, nominative in ν, or σ.

χιον-ο-φιλή (χίων, χιόνος, ἡ, snow, φίλος, loving) Chionophile 17

κλων-ο-στάχυς (κλών, κλωνός, ὁ, shoot, στάχυς, ὁ, spike) Clonostachys

χην-ο-ποδιον (χῆν, χηνός, ὁ, ἡ, goose, πόδιον, τό, small foot) Chenopodium 13

δελφιν-(ο)-αστρον (δελφίς, δελφίνος, ὁ, dolphin, ἄστρον, τό, star) Delphinastrium 3

κτεν-(ο)-οδους (κτείς, κτενός, ὁ, comb, ὀδοῦς, ὁ, tooth) Ctenodus 2

(b) Stem in λ, nominative in λ, or σ.

ἅλ-ο-δικτυον (ἅλς, ἅλός, ἡ, sea, δίκτυον, τό, net) Halodictyum 4:79 in ἅλι-

(c) Stem in ρ, nominative in ρ.

ἀνδρ-ο-πῶγων (ἀνήρ, ἀνδρός, ὁ, man, πῶγων, ὁ, beard) Andropogon 119

ἀστερ-(ο)-ομφαλος (ἀστήρ, ἀστέρος, ὁ, star, ὀμφαλός, ὁ, navel) Asteromphalus 19



γαστρ-ο-καρφη (γιστήρ, γαστρός, ἦ, belly, κάρφη, ἦ, dry scale)

Gastrocarche 1:16 in γαστρο-

θηρ-ο-μορφη (φήρ, θηρός, ὄ, beast, μορθή, ἦ, form) Theromorphe

44

πυρ-ο-λείριον (πῦρ, πυρός, τό, fire, λείριον, τό, lily) Pyrolirium

49:64 in -ι-; 11 in ρ-; 4 in -η-

(3) Stem in -ματ, nominative in -μα.

A special study of this class of imparisyllabics has been made for the sake of determining just what warrant existed in Greek for making the stem of the oblique cases the invariable form for composition. These were thought to constitute a very fair criterion on account of their wide extension, and for the further reason that they furnish a large number of alternatives, since the nominative might readily be supposed to represent a first declensional stem in -α. The Greek lexicon contains 1,782 neuters in -μα, largely secondary stems, though there are also many primary ones, these being by far the most frequent in composition. Of these 1,782 neuters, 231 are found in composition or derivation as the first term, occurring altogether in 969 derivatives. Of the 231, 208 occur in derivatives only in the proper stem form in -ματ, being used 555 times. Eleven words, ἄγαλμα, glory (13:1), ἄρμα, chariot (24:1), δέρμα, skin (9:1), θαῦμα, marvel (14:13), θεωρήμα, theory (2:1), κέρμα, small change (3:1), κύμα, wave (19:11), κῶμα, coma (2:1), ὄνομα, name (20:12), σῶμα, body (48:5) and φλέγμα, flame (12:4), show the alternative stems, ἀγαλματ- and ἀγαλμ-, though the former is preponderant, occurring in 166 derivatives, while the latter is found in only 51. Six words of this class, αἷμα, blood (32:72), ἔρμα, prop, (2:3), πῶμα, drink (3:4), σπέρμα, seed (16:22), στόμα, mouth (3:24), and χεῖμα, cold (1:4), occur more frequently in the shortened form, αἶμ-, the frequency being 129 to 57. Three only, δήλημα, bane (1), στάλαγμα, drop (1), and φράγμα, fence (3), are found invariably in the shortened form, while three, ἐπίπωμα, παρέγκυμα, and σίγμα occur once in each form. To sum-

marize the foregoing: of 231 neuters in *-μα*, which furnish stems for compounds or derivatives, 208 always appear in the proper stem form, *-ματ*, 11 occur more frequently in this form, 6 more frequently in the shortened form, *-μ*, 3 always in this short form, while 3 occur once in either form. Of 969 words derived from these neuters, 781 show the proper stem in *-ματ*, while 188 have the shortened stem in *-μ*. Again, it must be borne in mind that, while these alternative stems are a source of growth rather than a misfortune to the language, in nomenclature they must always lead to confusion, as analogy will sooner or later produce doublets, such as *αἱματίσπερμα* and *αἰμίσπερμα*, in the case of every stem which enters into composition. The marked preponderance of the proper stem in compounds of this group has been considered ample warrant for extending this stem to all compounds formed from neuters in *-μα*. If further warrant were needed, it is found in the fact that every neuter of this class shows the proper stem in the oblique cases, its disappearance in certain compounds being due to the use of the shortened nominative form, a use arising to a large extent out of ignorance.

*αἱματ-ο-χαρις* (*αἷμα, αἵματος, τό*, blood, *χάρις, ἡ*, grace) Haematocharis

*δερματ-ο-κυβη* (*δέρμα, δέρματος, τό*, skin, *κύβη, ἡ*, head) Dermatochybe

*πωματ-ο-δερρις* (*πῶμα, πώματος, τό*, drink, *δέρρις, ἡ*, leather coat) Pomatoderris

*θανματ-ο-περις* (*θαῦμα, θαύματος, τό*, wonder, *περίς, ἡ*, fern) Thaumatopteris

*σπερματ-ο-χνοος* (*σπέρμα, σπέρματος, τό*, seed, *χνόος, ὁ*, foam) Spermatochneous

*στοματ-ο-θηκιον* (*στόμα, στόματος, τό*, mouth, *θήκιον, τό*, little box) Stomatothecium

*σωματ-(ο)-αγγειον* (*σῶμα, σώματος, τό*, body, *ἀγγεῖον, τό*, vessel) Somatangium

- (4) Stem in *-ες*, genitive *-εος* (*-εσος*), nominative usually in *-ος*, mostly neuters. The form for composition is obtained by dropping *-εος* of the genitive, or *-ος* of the nominative.

κερδ-(ο)-ουρα (κέρδος, κέρδεος, τό, trick, οὐρά, ἡ, tail) *Cerdura* 4  
 βελ-ο-περονη (βέλος, βέλεος, τό, dart, περόνη, ἡ, point) *Beloperone*

7:1 in -εη

ἀγγ-ο-φορα (ἄγγος, ἄγγεος, τό, vase, φορά, a carrying) *Angophora* 1

χειλ-ο-σκυφος (χείλος, χείλεος, τό, lip, σκύφος, τό, cup) *Chiloscypus* 2

ἀνθ-ο-φυκος (ἄνθος, ἄνθεος, τό, flower, φῦκος, τό, seaweed) *Anthophycus* 46:2

φυκ-ο-φυτον (φῦκος, φύκεος, τό, seaweed, φυτόν, τό, plant) *Phycophytum* 3

*B. Vowel stems (in -ι or -υ).*

(1) Stem in -ι, nominative in -ις, masc. and fem., -ι, neut.

The stem is obtained by dropping -ος of the genitive, or -ς of masc. or fem. nominative.

ὄψι-(ο)-ανθος (ὄψις, ὄψιος, ὄψεως, ἡ look, ἄνθος, τό, flower) *Opsi-anthus*

ὄφι-ο-καρνον (ὄφις, ὄφιος, ὄφεως, ὁ, snake, κάρνον, τό, nut) *Ophiocaryum* 20

πεπερι-ο-φυλλον (πέπερι, πεπέριος, τό, pepper, φύλλον, τό, leaf) *Peperiophyllum* 1 in -ο

τροπι-ο-λεπς (τρόπις, τρόπιος, ἡ, keel, λεπς, ἡ, scale) *Tropiolepis*

φυσι-ο-γλωχίς (φύσις, φύσιος, φύσεως, ἡ, nature, γλωχίς, ἡ, point) *Physioglochis* 14

(2) Stem in -υ, nominative in -υς, (-αυς, -ευς, -ους) masc. and fem., -υ, neut. The stem is obtained by dropping -ος of the genitive, or -ς of the nominative.

δρυ-ο-πτερίς (δρῦς, δρύνος, ἡ, oak, πτερίς, ἡ, fern) *Dryopteris* 11:4 in -υ

μυ-(ο)-ουρα (μῦς, μνός, ὁ, mouse, οὐρά, ἡ, tail) *Myura* 18:2 in μυσ-

πιτυ-(ο)-οψις (πίτυς, πίντος, ἡ, pine tree, ὄψις, ἡ, look) *Pityopsis*  
 σταχυ-ο-βοτρύς (στάχυς, στάχυος, ὁ, spike, βότρυς, ὁ, bunch of grapes) *Stachyobotrys* 10:7 in -υη; 1 in -υ

Here are usually placed βούς, γράυς, ναύς. These originally had the stem in a consonant, digamma, as βοφ-, but the digamma was lost, leaving third declension stems in -ο and



-a. The proper stem is obtained by dropping -os of the genitive, though these stems are quite irregular in the matter of composition.

βο-ο-γληνος (βούς, βοός, ὁ, ox, γλήνη, ἡ, eyeball) ox-eyed 17:  
96 in βου-; 3 in βο-  
γρα-ο-λογία (γραῦς, γραός, ἡ, old woman, λογία, ἡ, speech) gossip  
6

Anomalous nouns. A few nouns are included here, in which the stem has been more than usually reduced in the nominative, e. g., γάλα, γόνυ, γυνή, δόρυ, μέλι.

γαλακτ-(ο)-ανθος (γάλα, γάλακτος, τό, milk, ἄνθος, τό, flower)  
Galactanthus 19

γονατ-ο-ζυγον (γόνυ, γόνατος, τό, knee, ζυγόν, τό, yoke) Gonatozy-  
gum 2:8 in γονυ-

γυναικ-ο-τροχας (γυνή, γυναικός, ἡ, wife, τροχάς, ἡ, shoe) Gynae-  
cotrochas 35:1 in γυνο-

δορατ-ο-λωμα (δόρυ, δόρατος, τό, stem, spear, λῶμα, τό, fringe)  
Doratology 6:21 in δορυ-

μελιτ-ο-ξύλον (μέλι, μέλιτος, τό, honey, ξύλον, τό, wood) Meli-  
toxylum 10:46 in μελι-

## II. Adjectives

1. First and second declension: stems in -a, or -o, nom. sing., -os, masc., -os, -η, -a, fem., -ον, neut. The stem (ending in its proper thematic vowel, -o, which is also the connective) is readily obtained by dropping -σ of the nominative singular masculine.

μακρο-χλαινη (μακρός, ἄ, ὄν, long, large, χλαῖνα, ἡ, cloak) Ma-  
crochlaena 99

ὀρθο-μερις (ὀρθός, ἡ, ὄν, straight, μέρος, ἡ, part) Orthomeris 92

ἑτερο-ραχis (ἕτερος, α, ον, different, ῥάχis, ἡ, back) Heteror-  
rhachis 125

λευκο-βρυον (λευκός, ἡ, ὄν, clear, white, βρύον, τό, alga, moss)  
Leucobryum 114

στενο-λοφος (στενός, ἡ, ὄν, narrow, λόφος, ὁ, crest) Stenolophus  
46

χρυσο-νεριον (χρύσεος, η, ον, golden, νήριον, τό, oleander) Chrys-  
onerium

μεσ-(ο)-ανθεμον (μέσος, η, ον, middle, ἄνθεμον, τό, flower) Mesanthemum 125

ἀπλο-ταξίς (ἀπλός, η, ον, simple, τάξις, ἡ, array) Haplotaxis 9

2. First and third declension. The feminines of this group follow the first declension, the masculines and neuters the third. According to the termination of the stem of the latter, there are two groups, the one with the stem in a consonant, the other with vowel-stem.

- a. Stem in a consonant, usually -ν or -τ, masc. in -ν or -ς, neut. in -ν. The stem is readily derived by dropping -ος of the genitive singular masculine.

μελαν-ο-στικτός (μέλας, αῖνα, αν, μέλανος, black, στικτός, pricked) Melanostictus 44: μελαν-, 70

παντ-ο-φίλος (πᾶς, πᾶσα, πᾶν, παντός, all, φίλος, loving) Panto-philus 114: παν-, 483

τερεν-ο-χρῶς (τέρην, εἶνα, εν, τέρενος, smooth, χρῶς, ὁ, skin) with smooth skin 1

- b. Stem in the vowel -ν; nom. sing. masc. in -νς, neut. in -ν. The stem is obtained by dropping -ς of the nominative singular masculine. Adjectives in -ν, unlike nouns of this class, do not take the connective -ο-. The use of the stem vowel, -ν, as connective is so nearly absolute that it has seemed unwise to extend the connective -ο- to this class.

ἀμβλυ-νοτός (ἀμβλός, εἶα, ύ, blunt, νότος, ὁ, south wind) Ambly-notus 3

βαθυ-φυτον (βαθός, deep, low, φυτόν, τό, plant) bathyphytum 86

βαρυ-ξύλον (βαρύς, heavy, ξύλον, τό, wood) Baryxylum 115

βραδυ-πιπτον (βραδός, slow, πιπτός, fallen) Bradypiptum 25

βραχυ-οδους (βραχύς, short, small, ὀδούς, ὁ, tooth) Brachyodus 52

γλυκυ-ρίζα (γλυκός, sweet, ρίζα, ἡ, root) Glycyrrhiza 30:2 in γλυκο-

δριμυ-φύλλον (δριμύς, sharp, φύλλον, τό, leaf) Drimyphyllum 3

εὐρυ-βάσις (εὐρύς, wide, broad, βάσις, ἡ, step, base) Eurybasis 66

ἡδυ-οσμος (ἡδύς, sweet, ὀσμή, ἡ, smell) Hedyosmus 58

θηλυ-χιτων (θηλὺς, female, tender, χιτών, ὁ, frock) Thelychiton

40

ἰθυ-θρίξ (ἰθύς, straight, θρίξ, ἡ, hair) Ithythrix 32

ὀξύ-ακανθα (ὀξύς, sharp, ἀκανθα, ἡ, thorn) Oxyacantha 137

παχυ-ουρα (παχύς, thick, stout, οὐρά, ἡ, tail) Pachyura 30

πλατυ-κωδων (πλατύς, wide, broad, κώδων, ὁ, ἡ, bell) Platycodon

51

πολυ-γαλα (πολύς, much, many, γάλα, τό, milk) Polygala 960

τραχυ-στημων (τραχύς, rough, rugged, στήμων, ἡ, thread) Trachystemon 16:3 in τριχ-

3. Third declension: stem endings various; nominative in -ης, -ες, -ων, -ον, -υς, -υν, -ις, -ι, -ωρ, -ορ; in one ending, -ας, -ης, -ις, -υς, or in the form of all nouns from which adjectives are derived without change (see last term). The form for composition is best obtained by dropping -ος of the genitive singular (-ους of contracts, nom. -ης, -ες).

πληρ-(ο)-ασκος (πλήρης, es, full, filled, ἀσκός, ὁ, leathern bag) Plerascus 3

ψευδ-ο-λινον (ψευδής, es, false, λίνον, τό, flax, thread) Pseudolinum 178:2 in -η

πεπον-ο-σικνος (πέπων, ον, πέπονος, ripe, σίκνος, ὁ, gourd) a kind of gourd

τροφι-(ο)-ανθος (τροφήις, τρέφιος, well-fed, ἄνθος, τό, flower) Trophianthus 1

ἄρρεν-(ο)-αχνη (ἄρρην (ἄρσην), εν, ἄρρενος, male, ἄχνη, ἡ, down) Arrhenachne 22

νομαδ-ο-κυστις (νομάς, νομάδος, roaming, κύστις, ἡ, bladder) Nomadocystis 1

συγκλυδ-ο-σπορα (σύγκλυς, σύγκλυδος, brought together, σπορά, ἡ, seed) Synclydospora 1

### *Irregular Adjectives*

μεγαλ-ο-χλοη (μέγας, μεγάλη, μέγα, μέγαλου, great, χλόη, ἡ, grass) 181:16 in μεγα-

## III. Numerals

1. Cardinals. εἰς, δύο, τρεῖς, τέσσαρες are declined; the numbers from πέντε through ἑκατὶν are indeclinable. The first four numerals rarely appear in the normal form in composition:



εἷς is represented by μόνος, η, ον, alone, one, δύο, by δι-, τρεῖς by τρι-, and τέσσαρες by τετρα-. The last three very rarely elide, and only before ι or α. The numerals from πέντε to δώδεκα should terminate in -α when compounded.

μονο-θρίξ (μόνος, η, ον, one, θρίξ, ἡ, hair) Monothrix

δι-ων (δι-, two- ὄν, τό, egg) Dioum

τρι-κερατιον (τρι-, three-, κεράτιον, τό, little horn) Triceratium

τετρ(α)-ακτις (τετρα-, four-, ἀκτίς, ἡ, ray) Tetractis

πεντα-πελτη (πέντε, five, πέλτη, ἡ, small shield) Pentapelte

ὀκτα-βλεφαρις (ὀκτώ, eight, βλεφαρίς, ἡ, eyelash) Octablepharis

δεκα-ραφη (δέκα, ten, ράφη, ἡ, seam) Decarraphe

2. Ordinals, and the higher cardinals in -α, enter into composition in the same manner as adjectives in -ος.

πρωτο-κοκκος (πρῶτος, η, ον, first, κόκκος, ὁ, berry) Protococcus

μυριο-φυσα (μυρίος, α, ον, numberless, φῦσα, ἡ, bubble) Myriophyssa

χιλιο-φυλλον (χίλιοι, αι, α, thousand, φύλλον, τό, leaf) Chilio-phyllum

#### IV. Indeclinables

1. Adverbs. These are rare in nominal compounds. They are attached immediately to the second member.

ἀγχι-σπορος (ἀγχι, near, σπορά, ἡ, seed) near of kin

ἀει-χρυσουν (ἀεί, ever, χρύσεος, golden) Aichrysum

ἀπαξ-ανθος (ἄπαξ, once, once only, ἄνθος, flowering) hapaxanthus

ἀρτι-θαλῆς (ἄρτι, just, exactly, θαλλός (\*θαλός) ὁ, shoot) just blooming

εὐ-ραμνος (εὖ, right, true, ῥάμνος, ἡ, thorn) Eurhamnus

χαμαι-νηριον (χαμαί, on the ground, νήριον, τό, oleander) Chaemaenerium

2. Prepositions. These are attached directly to the second member. The final vowel is elided before an initial vowel (except in περί, and πρό), and if the latter be aspirated, a preceding smooth explosive is roughened. Εκ becomes ἐξ before a vowel.

ἀμφι-δοναξ (ἀμφί, on both sides of, δόναξ, ὁ, reed) Amphidonax

ἀνα-χαρις (ἀνά, on, upward, χάρις, ἡ, grace) Anacharis

δια-φανη (διά, through, φανός, bright) Diaphane

καθ-εδρα (κατά, down, down from, ἔδρα, ἡ, seat) Cathedra  
 περι-ανθος (περί, around, ἄνθος, τό, flower) Perianthus  
 ὑπερ-ανθηρα (ὑπερ, over, ἄνθηρός, blooming) Hyperanthera  
 ὑπο-πιτυς (ὑπο, from under, πίτυς, ἡ, pine) Hypopitys

3. Inseparable particles. These are attached directly to the second member.

ἀ-φυλλον (ἀν-, before a consonant) without, φύλλον, τό, leaf)  
 Aphyllum

ἀν-ειλημα (ἀν-, without, εἶλημα, τό, veil) Anilema  
 ἀρι-ανθηρα (ἀρι-, very, quite, ἄνθηρός, flowering) Arianthera  
 δα-σκιος (δα-, intensitive, σκιά, ἡ, shade) thickly shaded, bushy  
 δυσ-μορφια (δυσ-, hard, bad, μορφία, ἡ, form) badness of form  
 ἐρι-τριχιον (ἐρι, very, much, τρίχιον, τό, little hair) Eritrichium  
 ζα-καλλης (ζα-, very, κάλλος, τό, beauty) very beautiful  
 ἡμι-γραφισ (ἡμι-, half, γραφίς, ἡ, style, needle) Hemigraphis  
 νη-πενθης (νη-, without, πένθος, τό, sorrow) Nepenthes

#### V. Verbal Stems

λειψι-θριξ (λείπω (λειψ-) lose, θρίξ, ἡ, hair) having lost the hair  
 λιπο-θριξ (λείπω (λιπ-), lose, θρίξ, ἡ, hair) wanting hair  
 ἀρχεσι-μολπος (ἄρχω (αρχεσ-) begin, μολπή, ἡ, song and dance)  
 beginning the strain  
 ἀρχε-κακος (ἄρχω (ἄρχ-), begin, κακός, bad) beginning mischief

## WORD FORMATION IN LATIN

### DERIVATION

Latin has developed derivation enormously, while composition has had a relatively feeble development. This is explained by the fact that derivation must have maintained the lead which it doubtless acquired during the formative period of the language, and, also, by the fact that the need for compound words during the classic and post-classic periods was supplied by repeated and extensive borrowing from Greek. Derivation has, in consequence, a much greater importance for the nomenclator than composition, a condition quite contrary to that which prevails in Greek. As in the latter language, nominal derivatives are formed by adding noun or adjective suffixes to roots or stems.

## NOUN SUFFIXES

*Agent*

- TOR (-SOR), m., -TRIX, f., primary or secondary verbal; rarely denominative: *da-tor*, giver; *ora-tor*, speaker; *ton-sor*, barber; *via-tor*, traveler; *impera-tor*, commander; *pisca-tor*, fisherman
- ES (stem -T, -IT, -ET), m. or f., primary: *ped-es*, walker; *com-es*, companion; *tram-es*, pathway
- O (stem -ON) m., primary: *combib-o*, pot-companion; *ger-o*, porter
- ARIUS, m., primary or secondary, verbal or denominative: *ferr-arius*, smith; *pisc-arius*, fishmonger

*Means or Instrument*

- BULUM, n., primary or secondary, usually verbal: *pa-bulum*, fodder; *vesti-bulum*, court
- CULUM (-CLUM), -CRUM, n., primary or secondary, usually verbal: *sar-culum*, hoe; *vin-clum*, fetter; *ful-crum*, support
- BRUM, n., -BRA, f., primary or secondary, verbal: *cri-brum*, sieve; *fla-brum*, blast; *tere-bra*, borer
- TRUM, n., -TRA, f., -TER, m., primary or secondary: *plaus-trum*, wagon; *mulc-tra*, milk-pail; *cul-ter*, knife
- MEN, -MENTUM, n., primary or secondary, usually verbal: *teg-men*, cover; *funda-mentum*, foundation

*Action or Result*

- OR, -IS, m., -ES, f., -US, n. (stem -OR, -ER), primary: *cal-or*, heat; *lab-or*, toil; *cin-is*, ashes; *pulv-is*, dust; *caed-es*, a setting-down; *nub-es*, cloud; *fun-us*, burial; *on-us*, burden
- TUS (-SUS), mostly masculine, primary: *fruc-tus*, fruit; *pas-tus*, food; *vic-tus*, food; *sen-sus*, perception
- IO (stem -ION), f., secondary verbal, rarely primary: *obsid-io*, siege; *reg-io*, district
- TIO (-SIO), (stem -TION), primary or secondary verbal: *auc-tio*, increase; *huma-tio*, burial; *conver-sio*, alteration
- TURA (-SURA), primary or secondary verbal: *tex-tura*, web; *commis-sura*, joint

- MEN, -MENTUM, n., primary or secondary verbal: *frag-men*, piece; *arma-mentum*, equipment
- MONIUM, n., -MONIA, f., primary or secondary, verbal or denominative: *testi-monium*, testimony; *ali-monia*, support; *sancti-monia*, sanctity

### Quality

- IA, -TIA, f., secondary denominative: *audac-ia*, boldness; *patient-ia*, patience; *nigri-tia*, blackness
- IES, -TIES, f., secondary denominative: *pernic-ies*, ruin; *segnit-ies*, laziness
- DO, f., secondary denominative or verbal: *arun-do*, reed; *hiru-do*, leech; *dulce-do*, sweetness
- GO, f., secondary denominative or verbal: *albu-go*, whiteness; *lanu-go*, down; *rubi-go*, redness, rust
- TAS, -TUS, f., secondary denominative: *cavi-tas*, hollow; *celerit-tas*, swiftness; *pleni-tas*, fulness; *senec-tus*, old age
- TUDO, f., secondary denominative: *ampli-tudo*, width; *crassitudo*, thickness
- IUM, -TIUM, secondary denominative or verbal: *auspic-ium*, omen; *hospit-ium*, inn; *servi-tium*, slavery
- ASTER, m., secondary denominative: *cle-aster*, wild olive

### Place

- ARIUM, n., primary or secondary denominative: *avi-arium*, poultry-yard; *herb-arium*, place for plants; *virid-arium*, garden
- ETUM, -TUM, n., primary or secondary denominative: *caric-etum*, field of sedges; *fruti-cetum*, thicket; *ros-ctum*, rose-garden; *arbus-tum*, grove; *salic-tum*, willow grove
- ILE, n., primary denominative: *bov-ile*, cattle yard; *ov-ile*, sheepfold
- TORIUM, n., secondary denominative: *audi-torium*, lecture room; *ora-torium*, oratory

### Diminutives

- ULUS (-OLUS after a vowel), primary or secondary denominative: *glob-ulus*, little globe; *herb-ula*, little herb; *capit-ulum*, little head; *atri-olum*, little hall; *osti-olum*, little mouth



- CULUS, -UNCULUS, primary or secondary denominative; *musculus*, little mouse; *nube-cula*, little cloud; *oper-culum*, little lid; *cent-unculus*, cloth of many colors; *orati-uncula*, little speech
- ELLUS, -ILLUS, primary or secondary denominative: *mis-ellus*, wretch; *lam-ella*, small leaf; *pat-ella*, small dish; *penicillus*, hair pencil; *osc-illum*, little face
- UNCIO, secondary denominative: *hom-uncio*, manikin

The gender of diminutives is regularly that of the stem to which they are attached.

Patronymics. These are formed by the regular Greek suffixes, which have given rise in Greek to adjectives that have become nouns in Latin.

#### ADJECTIVE SUFFIXES

##### *Ownership or Relation*

- ANUS, -ENUS, -INUS, primary or secondary denominative: *paganus*, rustic; *ser-enus*, calm; *mar-inus*, of the sea
- ACUS, -ICUS, primary or secondary denominative: *pausi-acus*, olive-colored; *hepat-icus*, liver-colored
- ALIS, -ELIS, -ILIS, -ULUS, primary or secondary denominative: *litor-alis*, of the shore; *hum-ilis*, lowly; *ed-ulis*, edible
- ARIS, -ARIUS, -TORIUS, primary or secondary denominative: *milit-aris*, martial; *lamin-arius*, blade-like; *desul-torius*, of a vaulter
- ATUS, -ITUS, -UTUS, primary or secondary denominative: *ped-atus*, having a foot; *turr-itus*, turreted; *hirs-utus*, rough
- EUS, -EIUS, -ICIUS, primary or secondary denominative: *frond-eus*, leafy; *pleb-eius*, of the commons; *advent-icius*, foreign

##### *Material*

- ACEUS, -ICIUS, primary or secondary denominative: *ochraceus*, of ochre; *viol-aceus*, violet-colored; *later-icius*, brick red
- EUS, -IUS, -EIUS, primary or secondary denominative: *lign-eus*, of wood; *ros-eus*, rosy; *aur-eus*, golden; *limon-ius*, lemon yellow; *chalyb-eius*, of steel

- INUS, -INEUS, -GNUS, primary or secondary denominative: *lilac-inus*, lilac-colored; *querc-inus*, oaken; *frax-ineus*, ashen; *fulig-ineus*, soot-black; *abie-gnus*, of fir-wood; *sali-gnus*, of willow

### Quality or Fitness

- AX, primary: *ten-ax*, tenacious; *rap-ax*, furious; *vor-ax*, consuming
- IDUS, -ULUS, primary: *flor-idus*, blooming; *morb-idus*, diseased; *cred-ulus*, trustful; *pend-ulus*, hanging
- VUS (-UUS), -IVUS, -TIVUS, primary or secondary verbal or denominative: *decid-uus*, apt to fall; *aest-ivus*, of summer; *fugi-tivus*, fleeing
- IUS, primary or secondary denominative or verbal: *patr-ius*, paternal; *exim-ius*, choice
- ILIS, -BILIS, -TILIS (-SILIS), secondary verbal: *flex-ilis*, flexible; *fac-ilis*, easy; *nota-bilis*, noteworthy; *plica-tilis*, twisted; *fos-silis*, dug up

### Fulness

- OSUS, secondary denominative: *form-osus*, beautiful; *silv-osus*, forested; *lim-osus*, muddy
- (O)LENS, -(O)LENTUS, primary or secondary denominative: *grave-olens*, of heavy odor; *succu-lentus*, fresh, full of juice; *lutu-lentus*, muddy
- BUNDUS, -CUNDUS, primary or secondary verbal, rarely denominative: *erra-bundus*, vagrant; *fe-cundus*, fruitful; *rubi-cundus*, ruddy

### Place or Origin

- ANUS, -ANEUS, -ENUS, primary or secondary denominative: *mont-anus*, of the mountains; *subterr-aneus*, underground; *terr-enus*, earthy
- ENSIS, primary or secondary denominative: *for-ensis*, of the market place; *padov-ensis*, of Padua
- ESTER, (-ESTRIS), -TER (-TRIS), primary or secondary denominative: *camp-ester*, of the fields; *silv-estris*, forest; *lacus-ter*, of a lake; *palus-tris*, marshy

- TIMUS, secondary denominative: *mari-timus*, of the sea; *fini-timus*, bordering

### Time

- ANUS, primary or secondary denominative: *anteluc-anus*, before daybreak; *meridi-anus*, of midday; *cotidi-anus*, daily
- ERNUS, (-TERNUS), -URNUS (-TURNUS), primary or secondary denominative: *hib-ernus*, wintry; *sempi-ternus*, everlasting; *di-urnus*, by day; *noct-urnus*, nocturnal
- NUS, secondary denominative: *autum-nus*, of autumn; *ver-nus*, vernal

### Diminutives

- ULUS (-OLUS), secondary denominative: *frigid-ulus*, chilly; *lute-olus*, yellowish
- CULUS, secondary denominative, especially common with the neuter of the comparative: *minus-culus*, somewhat smaller; *crassius-culus*, somewhat thick

### COMPOSITION

Latin, like Greek, exhibits two methods of composition, syntactic and non-syntactic. The former, found in such compounds as *aquaeductus*, *nomenclator*, *respublica*, and *paterfamilias*, is rare and archaic, and needs to be noticed only to call attention to its use in specific names, such as *urticaefolia*, *menthaeflora*, etc., which should be treated as non-syntactic and written *urticifolia*, *menthiflora*, etc. Non-syntactic composition has been developed to a certain extent in Latin, but the language is far inferior to Greek in this regard. Latin has largely obviated the need of composition by a wide extension of derivation, with the result that composition always seems awkward and foreign to the language. Notwithstanding this, Latin has a large number of compounds, mostly adjectives, which have been used by biologists, and new compounds will doubtless be made upon the model afforded by these. It should be borne in mind that derivation by suffixes is the easy and natural method of word formation in Latin, as composition is the natural way in Greek, and a desir-

able working rule might be formulated to the effect that derivatives be taken from Latin and compounds from Greek. Linne<sup>1</sup> has written as follows upon this point: "Nomina generica ex duobus vocabulis latinis integris & conjunctis composita, vix toleranda sunt. Ejusmodi vocabula, graeca lingua pulcherrima sunt; at Latina non facile eadem admittit. Admissimus nonnulla vocabula latina, sed non ideo in posterum imitanda sunt."

#### THE LAST TERM

The last term is a noun, adjective, or verbal stem. According to the nature of the last term, its form is as follows:

- I. If the last term is a noun, the compound (1) will be a noun:
  - angi-portus* (\**angus*, strait, *portus*, harbor) a narrow street
  - ante-cursor* (*ante*, before, *cursor*, runner) forerunner, vanguard
  - tri-dens* (*tri*, three, *dens*, tooth) trident
  - nemori-cultrix* (*nemus*, *nemoris*, forest, *cultrix*, cultivator) forest-lover
  - mani-pretium* (*manus*, hand, *pretium*, price) workman's pay
  - albo-galerus* (*albus*, white, *galerus*, hat) white hat of a flamen
- (2) or the compound will be an adjective, appearing in one of three forms: (1) *us*, *a*, *um*; (2) *is*, *e*; (3) the form of the noun.
- (a) If the last term belong to the first, second, or fourth declension (stem in *-a*, *-o*, and *-u*, respectively), the compound adjective will regularly take the terminations of the first and second declensions (*us*, m., *a*, f., *um*, n.), or it may take the endings of the third declension (*is*, m., f., *e*, n.)
  - in-formis* (*in*, not, *forma*, form) formless
  - igni-comus* (*ignis*, fire, *coma*, hair) fiery-haired
  - magni-sonus* (*magnus*, great, *sonus*, sound) loud-sounding
  - multi-vius* (*multus*, many, *via*, way) having many ways
  - albi-cerus*, *albi-ceris* (*albus*, white, *cera*, wax) wax-white

<sup>1</sup> Linné. *Philosophia Botanica*, 160. 1751.



*uni-cornis, uni-cornus* (*unus*, one, *cornu*, horn) with one horn

*angui-manus* (*anguis*, snake, *manus*, hand) with serpent hand

*magn-animus, magn-animis* (*magnus*, great, *animus*, soul) great-souled

*long-aevus* (*longus*, long, *aevum*, age) of great age

*multi-jugus, -jugis* (*multus*, many, *jugum*, yoke) yoked many together

*multi-meter* (*multus*, many, *metrum*, measure) of many feet

(b) If the last term belong to the third declension (stem in a consonant or in *-i*) the compound adjective will have the form and inflection of a noun, or its stem may take the endings *us, a, um*, or, more rarely, *is, e*.

*aequi-lanx* (*aequus*, equal, *lanx*, scale) with equal scale

*in-frons* (*in*, without, *frons*, leaf) without foliage

*nigri-color* (*niger*, black, *color*, color) of a black color

*multi-pes* (*multus*, many, *pes*, foot) many-footed

*multi-radix* (*multus*, many, *radix*, root) many-rooted

*uni-finis* (*unus*, one, *finis*, limit) possessing the same termination

*semi-bos* (*semi*, half, *bos*, ox) half-ox

*bi-dens* (*bi*, two, *dens*, tooth) two-toothed

*aequi-pes, aequi-pedis* (*aequus*, equal, *pes*, foot) isosceles

*in-orus* (*in*, not, *os, oris*, mouth) without a mouth

*multi-colorus* (*multus*, many, *color, coloris*, color) many-colored

*multi-nominis* (*multus*, many, *nomen, nominis*, name) many-named

*multi-genus, -generis, -generis*, (*multus*, *genus, generis*, kind) of many kinds

*multi-laudus* (*multus*, *laus, laudis*, praise) much-praised

*aequi-latus, aequi-laterus* (*aequus*, equal, *latus, lateris*, side) equilateral

(c) If the last term belong to the fifth declension, the compound adjectives will appear in *us, a, um*, or, rarely, in the form of a noun.

*levi-fidus* (*levis*, light, *fides*, faith) of little faith  
*per-dius* (*per*, through, *dies*, day) throughout the day  
*ex-spes* (*ex*, out of, *spes*, hope) hopeless

- II. If the last term is an adjective, it will not be changed, though noun suffixes may be added to it, thus making a substantive.

*igni-potens* (*ignis*, fire, *potens*, powerful) potent in fire  
*aequi-par* (*aequus*, even, *par*, equal) perfectly equal  
*semi-sepultus* (*semi*, half, *sepultus*, buried) half buried  
*anim-aequus* (*animus*, mind, *aequus*, even) not easily moved  
*albo-gilvus* (*albus*, white, *gilvus*, pale-yellow) whitish yellow  
*longi-vivax* (*longus*, long, *vivax*, tenacious of life) long-lived

- III. If the last term is a verbal stem, the compound may be a noun of the first or third declension, or an adjective of three terminations or one termination.

*limi-cola* (*limus*, mud, *colo*, dwell) a mud-dweller  
*lapi-cida* (*lapis*, *lapidis*, stone, *caedo*, cut) a stone-cutter  
*tubi-cen* (*tuba*, trumpet, *cano*, sing) a trumpeter  
*man-ceps* (*manus*, hand, *capio*, take) purchaser  
*frugi-legus* (*frux*, *frugis*, fruit, *lego*, collect) fruit-gathering  
*herbi-gradus* (*herba*, grass, *gradior*, go) going in the grass  
*multi-fidus* (*multus*, many, *findo*, cleave) many-cleft  
*gemmi-fer* (*gemma*, bud, *fero*, bear) bearing buds  
*spini-ger* (*spina*, thorn, *gero*, bear) thorn-bearing

#### THE CONNECTIVE

The connecting vowel, *-i-*, has been so extended in Latin that the language practically knows no other connective. An *-o-* has found its way into some words after the analogy of Greek compounds, but these, as well as those in which the connecting vowel is *-u-*, are so rare that all connectives other than *-i-* may be entirely disregarded.

#### THE FIRST TERM

The first term of the compound in Latin may be a nominal stem (noun or adjective), an indeclinable (adverb, preposition,

or inseparable particle), or more rarely a verbal stem. Nouns are extremely rare as the first term of Latin compounds, except where the last term is a verbal stem. Adjectives likewise, with the exception of numerals and a few common words such as *aequus*, *longus*, *multus*, etc., are rarely found in composition. In consequence, the first terms of Latin compounds are very largely made up of numerals and indeclinables, the latter taking, of course, no connective. In Latin, inflected stems appear almost invariably in the proper stem form. The infrequency of such stems in composition doubtless accounts in a large measure for this uniformity.

### NOUNS

*lani-pes* (*lana*, wool, *pes*, foot) with wool on the feet  
*limi-genus* (*limus*, mud, *gigno*, bring forth) mud-born  
*grani-fer* (*granum*, grain, *fero*, bear) grain-bearing  
*funi-repus* (*funis*, rope, *repo*, creep) rope-dancer  
*frugi-ferens* (*frux*, *frugis*, fruit, *ferens*, bearing) fruitful  
*corpori-cida* (*corpus*, *corporis*, body, *caedo*, cut) butcher  
*ori-putidus* (*os*, *oris*, mouth, *putidus*, fetid) with vile mouth  
*corni-frons* (*cornu*, horn, *frons*, forehead) with horned forehead  
*lacu-turris* (*lacus*, lake, *turris*, tower) a kind of cabbage  
*fidei-commissum* (*fides*, trust, *committo*, commit) a bequest in trust

### ADJECTIVES

*laeti-ficus* (*laetus*, glad, *facio*, make) gladdening  
*solι-vagus* (*solus*, alone, *vagor*, wander) wandering alone  
*tardi-gradus* (*tardus*, slow, *gradior*, walk) slow-paced  
*atri-capillus* (*ater*, black, *capillus*, hair of the head) black-haired  
*grandi-scapius* (*grandis*, great, *scapus*, stem) having a large stem  
*levi-caulis* (*levis*, smooth, *caulis*, stem) smooth-stemmed  
*pleuri-laterus* (*plus*, *pluris*, more, *latus*, *lateris*, side) with several sides  
*serpenti-pes* (*serpens*, creeping, *pes*, foot) serpent-footed

NUMERALS. *Unus*, *centum*, the higher cardinals and all ordinals appear in the stem form with *-i-* as the connective, the remaining cardinals are unchanged: *duo*, two, is replaced by *bi-*, *tres*, three, by *tri-*, and *quattuor*, four, by *quadri-*.

*uni-folius* (*unus*, one, *folium*, leaf) one-leaved  
*bi-fidus* (*bi*, two, *findo*, cleave) cleft into two parts  
*tri-furcus* (*tri*, three, *furca*, prong) three-pronged  
*quadri-jugis* (*quadri*, four, *jugum*, yoke) yoked in fours  
*quinque-partitus* (*quinque*, five, *partio*, divide) five-parted  
*septem-nervus* (*septem*, seven, *nervus*, nerve) seven-nerved  
*decem-remis* (*decem*, ten, *remus*, oar) ten-oared  
*centi-ceps* (*centum*, hundred, *caput*, head) hundred-headed  
*primi-formis* (*primus*, first, *forma*, form) original  
*quinti-ceps* (*quintus*, fifth, *caput*, head) having five peaks

#### INDECLINABLES

Adverbs and adverbial prefixes:

*semper-florium* (*semper*, always, *flos*, flower) evergreen  
*paen-ultimus* (*paene*, nearly, *ultimus*, last) last but one  
*per-magnus* (*per*, very, *magnus*, large) very large  
*prae-longus* (*prae*, very, *longus*, long) very long  
*in-divisus* (*in*, not, *divido*, divide) undivided  
*sub-globosus* (*sub*, rather, somewhat, *globosus*, spherical)  
 nearly spherical

Prepositions:

*ab-normis* (*ab*, away from, *norma*, rule) irregular  
*ac-clivus* (*ad*, to, *clivus*, slope) steep  
*ante-pes* (*ante*, before, *pes*, foot) forefoot  
*circum-scissus* (*circum*, around, *scindo*, split) split around  
*com-mutabilis* (*cum*, together with, *mutabilis*, changeful)  
 subject to change  
*de-jugis* (*de*, from, *jugum*, yoke) sloping  
*ex-aridus* (*ex*, out, *aridus*, dry) dried out  
*in-fuscus* (*in*, in, *fuscus*, dark) dark-brown  
*inter-nodium* (*inter*, between, *nodus*, knot) internode  
*ob-stipus* (*ob*, towards, *stipes*, stalk) bent to one side  
*super-nans* (*super*, above, *no*, swim) swimming at the top



## Inseparables :

*ambi-formis* (*ambi*, around, *forma*, form) of doubtful form

*dis-calceatis* (*dis*, without, *calceo*, put on shoes) barefooted

*re-formatus* (*re*, back, again, *firmitas*, fix) re-establish

*se-jugis* (*se*, apart, *jugum*, yoke) disjoined

*ve-grandis* (*ve*, out, not, *grandis*, large) not very large, small

## ALTERNATIVES

Duplicate names or terms may arise in nomenclature from alternative words, stems, connectives, or terminations, or from the alternative use of nouns, adjectives, and verbal stems from the same root to form the last term of a compound. In Latin, alternatives cause little trouble because of the slight development of composition, and for the reason that Latin derivatives are largely specific. In Greek, the confusion arising from alternatives is great, and it is imperative that composition be made to conform to certain definite rules. An observance of the following rules in making compounds will aid greatly in preventing the occurrence of real duplicates, as well as the occurrence of extremely similar, though perfectly distinct compounds, which are a source of vexation to many biologists.

(1) When the language shows two or more alternative words, such as *χάσμα* and *χάσμη*, *γράμμα* and *γραμμή*, *γραφίς* and *γραφή*, the more primitive word should be chosen. As this involves a considerable knowledge of Greek, the only safe plan is for the coiner to make sure that his proposed compound does not appear in an alternative form. This may be readily done at the same time that he assures himself that the word does not already exist in his science in the form in which he proposes it.

(2) Duplicates arising from alternative stems and connectives are readily avoided by observing the rule already suggested, viz., that the proper connective is always *-o-* in Greek and that words always enter into composition in the full stem form.

(3) Since a root may often appear in the first term of the compound as a noun, adjective, or verbal stem, it is advisable that the coiner of a name should avoid using a root already found in either of its other forms in composition with the same last term.

(4) The last term of a generic name should be a noun. Although such compounds usually become adjectives in Greek, the confusion which thus arises from alternative endings or gender terminations can only be avoided by restricting such compounds to the form and gender of the noun of the last term, i. e., the last term of a compound should always remain unchanged.

(5) Verbals should be invariably avoided in compounding nouns and adjectives, i. e., in all the composition found in nomenclature. A compound of identical or similar meaning can always be secured by employing a noun or adjective, and the use of verbal stems, in many ways peculiar, should be left to the philologist.

(6) The repeated use of different suffixes in connection with the same generic compound, or indeed with the same last term, should be carefully avoided.

(7) The alternative termination of Latin compound adjectives in *-us* and *-is*, though hardly productive of any real difficulty, might well be avoided for the sake of the biologist who does not understand that these are merely alternative endings. Saint-Lager<sup>1</sup> has suggested that terminations in *-us* be assimilated to *-is*, and this suggestion might well be carried out, although the *-us* termination has the slight advantage of indicating gender somewhat more definitely.

#### ACCENT

The accent of all Greek and Latin derivatives in science is determined by the accentuation of Latin, since all Greek words after transliteration are governed, of course, by the usual rules of accent for Latin words. These are as follows:

- (1) The ultimate is never accented.
- (2) In words of two or more syllables the accent is on the penult when this is long; when the penult is short, the antepenult is accented.

#### GENDER

The gender of a name is the gender of the last term in its proper language, whether the termination conform or not. The

<sup>1</sup>Saint-Lager. *Chapitre de Grammaire à l'usage des botanistes*. 1892.

gender of the primitive may be changed at any time, of course, by the addition of a proper suffix of a different gender. The most frequent mistakes in the matter of gender occur in connection with Greek neuters in *-a*, *-as*, and *-os*; thus, γάλα, milk, and κρέας, meat, are usually regarded as feminines, when found as the last term of a compound, and ἄνθος, flower, as masculine.

### CORRECTION LIST

In this list are included a number of the more common generic names which show improper formation. No attempt has been made to make the list exhaustive, as this would be an idle expenditure of time until there is a wider appreciation of the necessity of placing nomenclature upon a classical basis. The names given here serve simply as examples of the malformations which abound throughout biological nomenclature. The duplicate names which arise from malformations or from alternatives are discussed under section IV.

#### I. Compound with improper stem, often also with faulty connective.

Acianthus = Acidanthus (ἀκίς, ἀκίδος, ἡ, point)

Acilepis = Acidolepis

Acispermum = Acidosperma (σπέρμι, σπέρματος, τό, seed)

Acleisanthus = Acleanthus (ἀκλεής, inglorious)

Acrosanthus = Acranthus (ἄκρος, α, ον, at the point, highest)

Agrostistachys = Agrostidostachys (ἄγροστις, ιδος, ἡ, grass)

Ambirion = Amblylirium (ἀμβλύς, blunt, dull)

Amianthium = Amiantanthium (ἀμιάντος, ον, pure)

Chimophila = Chimatophiln (χείμα, χείματος, τό, cold, frost)

Chiococca = Chionococcus (χιών, χιόνος, ἡ, snow)

Chiogenes = Chionogenes

Chroococcus = Chrotococcus (χρῶς, χρωτός, ὁ, skin, color)

Coleosanthus = Coleanthus (κολεός, ὁ, sheath)

Cybianthus = Cybanthus (κύβη, ἡ, head)

Cynosurus = Cynura (κύων, κυνός, ὁ, dog)

Dasanthera = Dasyanthera (δασός, shaggy, cfr. δάσος, shagginess)

- Dermosporium = Dermatosporium (δέρμα, δέρματος, τό, skin)  
 Dermocybe = Dermatocybe  
 Eilemanthus = Ilematanthus (εἶλημα, εἰλήματος, τό, veil)  
 Epigynanthus = Epigynaecanthus (γυνή, γυναικός, ἡ, woman)  
 Galanthus = Galactanthus (γάλα, γάλακτος, τό, milk)  
 Galarhoeus = Galactorrheus  
 Gasteranthus = Gastranthus (γαστήρ, γαστρός, ἡ, belly)  
 Geropogon = Gerontopogon (γέρων, γέροντος, ὁ, old man)  
 Gigandra = Gigantandra (γίγας, γίγαντος, ὁ, giant)  
 Gynopogon = Gynaecopogon (γυνή, γυναικός, ἡ, woman)  
 Haemocarpus = Haematocarpus (αἷμα, αἵματος, τό, blood)  
 Hedysarum = Hedyarum (ἡδύς, sweet, but ἡδύσαρον, Diosc.!)  
 Helixanthera = Helicanthera (ἑλιξ, ἶκος, twisted)  
 Homalobus = Homalolobus (ὁμαλός, even, equal), hardly Homolobus (ὁμός, one and the same)  
 Ilysanthus = Ilyanthus (ἰλός, ἡ, mud)  
 Iondraba = Iodrabe (ἰον, τό, violet)  
 Ionactis = Iactis  
 Isonanthus = Isanthus (ἴσος, equal)  
 Kalosanthus = Calanthus (καλός, beautiful; better, Callianthus, καλλι-)  
 Korycarpus = Corythocarpus (κόρυς, κόρυθος, ἡ, helmet)  
 Lacistema = Lacidostema (λακίς, λακίδος, ἡ, rent)  
 Leontostomium = Leontostomatium (στόμα, στόματος, τό, mouth)  
 Lepargyrea = Lepidargyrea (λεπίς, λεπίδος, ἡ, scale, also λέπος, τό, scale)  
 Lepicystis = Lepidocystis  
 Lepisanthus = Lepidanthus  
 Manisuris = Manura (μανός, rare, porous)  
 Megacephalum = Megalocephalum (μέγας, μέγαλον, great)  
 Megapterium = Megalopterium  
 Megasanthus = Megalanthus  
 Melasanthus = Melananthus (μέλας, μέλανος, black)  
 Melianthus = Melitanthus (μέλι, μέλιτος, τό, honey)  
 Melilotus = Melitolotus  
 Myosurus = Myura (μῦς, μνός, ὁ, mouse)



- Namaspora = Namatospora (νάμα, νάματος, τό, stream)  
 Nemacladus = Nematocladus (νήμα, νήματος, τό, thread)  
 Nemastylis = Nematostylis  
 Onygena = Onychogenes (ὄνυξ, ὄνυχος, ὁ, nail, claw)  
 Oonopsis = Oopsis (ὄόν, τό, egg)  
 Ophispermum = Ophiosperma (ὄφης, ὄφιος, ὁ, snake)  
 Pachysandra = Pachyandra (παχύς, thick)  
 Pachysanthus = Pachyanthus  
 Peliosanthus = Pelianthus (πελιός, livid)  
 Pholistoma = Pholidostoma (φολίσ, φολιδος, ἡ, horny scale, spot)  
 Pyxipoma = Pyxidopoma (πυξίς, πυξίδος, ἡ, a box of boxwood)  
 Raphiolepis = Rhabdolepis (ράφίς, ραφίδος, ἡ, needle)  
 Regmandra = Rhegmatandra (ρήγμα, ρήγματος, τό, fracture)  
 Rhexantha = Rhexianthe (ρήξις, ρήξεως, ἡ, rending, rent)  
 Salpianthus = Salpinganthus (σάλπιγξ, σάλπιγγος, ἡ, war-trumpet)  
 Salpianthus = Salpinganthus  
 Schismoceras = Schismatoceras (σχίσμα, σχίσματος, τό, cleft; cf. σχισμή, ἡ)  
 Scolosanthus = Scolanthus (σκῶλος, ὁ, stake; better, Scolopanthus from σκόλοψ, ὁ)  
 Spermacoce = Spermatococe (σπέρμα, σπέρματος, τό, seed)  
 Spermolepis = Spermatolepis  
 Stachysanthus = Stachyanthus (στάχυς, στάχνος, ὁ, spike)  
 Stemastrum = Stematastrum (στήμα, στήματος, τό, stamen)  
 Stigmanthus = Stigmatanthus (στίγμα, στίγματος, τό, point; cf. στιγμή, ἡ)  
 Thisantha = Thinanthe (θίς, θινός, ὁ, ἡ, sand)  
 Thrixpermum = Trichosperma (θρίξ, τριχός, ἡ, hair)  
 Toxylon = Toxoxylum (τόξον, τό, bow)  
 Tremanthus = Trematanthus (τρήμα, τρήματος, τό, hole)  
 Trichosantes = Trichanthus (θρίξ, τριχός, ἡ, hair)

## II. Compounds with improper connective.

- Acanthophippium = Acanthephippium (ἄκανθα, ἡ, thorn, ἐφίππιον, τό, saddle)  
 Actegiton = Actogiton (ἄκτῆ, ἡ, headland, seacoast)  
 Actephila = Actophila

- Aloexylon = Alo(o)xylum (ἀλόη, ἡ, aloe)  
 Amaracarpus = Amarocarpus (ἀμάρα, ἡ, trench)  
 Amb yocarpum = Amblycarpum (ἀμβλύς, blunt)  
 Amecarpus = Amocarpus (ἄμη, ἡ, mattock)  
 Ammodenia = Ammadenia (ἄμμος, ἡ, sand, ἀδήν, ὁ, gland)  
 Ampelygonum = Ampelogyony (ἄπελος, ἡ, vine)  
 Amphiorhox = Amphirrhox (ἀμφί, around, on both sides)  
 Andripetalum = Andropetalum (ἀνήρ, ἀνδρός, ὁ, man)  
 Andriopetalum = Andropetalum (cfr. ἀνδρίον, τό, manikin)  
 Anthephora = Anthophora (ἄνθος, τό, flower, cfr. ἄνθη, ἡ)  
 Artanema = Artonema (ἄρτος, ὁ, loaf of bread)  
 Batheogyne = Bathygyne (βαθύς, deep, high)  
 Beloanthera = Belanthera (βέλος, τό, dart)  
 Blephariglottis = Blepharidoglottis (βλεφαρίς, ἰδος, ἡ, eyelash,  
 cfr. βλέφαρον, τό, eyelid)  
 Blepharispermum = Blepharidosperma  
 Botryceras = Botryoceras (βότρυς, βότρυος, ὁ, cluster of grapes)  
 Brachyolobus = Brachylobus (βραχύς, short)  
 Chorioactis = Choriactis (χόριον, τό, membrane)  
 Coreopsis = Coriopsis (κόρις, κόριος, ὁ, bug)  
 Corispermum = Coriosperma  
 Cypripedium = Cypridopedium (Κύπρις, ἰδος, ἡ, Aphrodite)  
 Dacrymyces = Dacryomyces (δάκρυον, τό, tear, cfr. δάκρυ, τό)  
 Dacrycarpos = Dacryocarpus  
 Dasiphora = Dasyphora  
 Dasyochloa = Dasychloe (δασύς, shaggy)  
 Dictyderma = Dictyoderma (δίκτυον, τό, fishing net)  
 Endespermum = Endosperma (ἐνδον, within)  
 Gaiadendron = Gaiodendrum (γαῖα, ἡ, earth; better, Geoden-  
 drum from γῆ)  
 Glyphyllaea = Glyphidophyllaea (γλυφίς, γλυφίδος, ἡ, notch)  
 Graphephorum = Graphophorum (γραφή, ἡ, drawing)  
 Halicoccus = Halococcus (ἅλς, ἅλός, ἡ, sea)  
 Halyseris = Haloseris  
 Harpaecarpus = Harpocarpus (ἄρπη, ἡ, bird of prey, sickle)  
 Harpechloa = Harpochloe  
 Hebeanthe = Hebanthus (ἥβη, ἡ, youth)

- Hebeloma = Heboloma  
 Heleocharis = Helocharis (ἔλος, ἔλεος, τό, marsh)  
 Heleochloa = Helochloe  
 Helichrysum = Heliochrysum (ἥλιος, ὁ, sun)  
 Hyoscyamus = Hyocyamus (ὕς, ὕός, ὁ, ἡ, swine)  
 Ixonanthes = Ixanthes (ἰξός, ὁ, mistletoe)  
 Lachnastoma = Lachnostoma (λάχνη, ἡ, down)  
 Menispermum = Menosperma (μήνη, ἡ, moon)  
 Napeanthus = Napanthus (νάπη, ἡ, woody dell)  
 Nomaphila = Nomophila (νομός, ὁ, pasture)  
 Opegrapha = Opographe (ὀπή, ἡ, opening)  
 Oreocarya = Orocarya (ὄρος, ὄρεος, τό, mountain)  
 Oreodoxa = Orodoxa  
 Pachyospora = Pachyspora (παχύς, thick)  
 Pellacalyx = Pellocalyx (πέλλα, ἡ, leather)  
 Pentstemon = Pentastemon (πέντε, πεντα-, five)  
 Phleboanthe = Phlebanthe (φλέψ, φλεβός, ἡ, vein)  
 Phoradendron = Phorodendrum (φώρ, φωρός, ὁ, thief)  
 Retiniphyllum = Rhetinophyllum (ῥητίνη, ἡ, resin of the pine)  
 Retinispora = Rhetinospora  
 Rhamphicarpa = Rhamphidocarpus (ῥαμφίς, ῥαμφίδος, ἡ, hook)  
 Scaphespermum = Scaphosperma (σκάφος, τό, hollow)  
 Sciaphila = Sciophile (σκιά, ἡ, shade)  
 Stictyosiphon = Stictosiphon (στικτός, ἡ, ὄν, pricked)  
 Stylipus = Stylopus (στῦλος, ὁ, pillar, cfr. στυλός, ἡ)  
 Telipogon = Telopogon (τέλος, τό, end)  
 Thallisphaera = Thallosphaera (θαλλίς, ἡ, young shoot)  
 Thelebolus = Thelobolus (θηλή, ἡ, nipple)  
 Thelephora = Thelophora  
 Thelesperma = Thelosperma  
 Theleophytum = Thelophytum  
 Xyloaloe = Xylaloe (ξύλον, τό, wood)  
 Zygnema = Zygonema (ζυγόν, ὁ, yoke)

### III. Compounds with improper ending.

For reasons already given, the following compounds are corrected to conform to the primitive form of the last terms. Since it may not be clearly understood that certain adjective

endings are incorrect, while others are correct but confusing, a summary is given of the correct endings for compound adjectives based upon nouns of the different declensions:

First and second declension: -ος, -ον

Third declension:

Stems in ν, ρ, δ: no change, rarely -ων, or -ωρ, or -ος, -ον

Stems in any other consonant, or in -ες: -ος, -ον

Stems in -ατ, nom. -ας: -ως, -ων, or -ος, -ον

Stems in -ι or -υ: no change, or -ος, -ον

Acanthobotrya = Acanthobotrys (βότρυς, ὁ, a cluster of grapes)

Acanthocarpa = Acanthocarpus (καρπός, ὁ, fruit)

Acrodryon = Acrodrys (δρύς, ἡ, oak. Acrodryus, -um is permissible but rare)

Acrospermum = Acrosperma (σπέρμα, τό, seed)

Acrotriche = Acrothrix (θρίξ, τριχός, ἡ, hair)

Amphilophis = Amphilophus (λίφος, ὁ, crest)

Botrytis = Botryites (βοτρυίτης, ὁ, like grapes)

Callistachya = Callistachys (στάχυς, ὁ, spike)

Calycera = Calliceras (κέρας, τό, horn)

Ceratocaulis = Ceratocaulus (καυλός, ὁ, stalk)

Centrophyta = Centrophytum (φυτόν, τό, plant)

Chamaemeles = Chamaemelum (μῆλον, τό, apple)

Cheilococca = Chilococcus (κόκκος, ὁ, berry)

Cyanotis = Cyanus or Cyanotus (ὄψις, ὠτός, τό, ear)

Cyclopeltis = Cyclopelte (πέλτη, ἡ, small shield)

Cyrtorrhyncha = Cyrtorrhynchus (ρύγχος, τό, snout)

Dasytricha = Dasythrix (θρίξ, τριχός, ἡ, hair)

Desmophlebis = Desmophleps (φλέψ, ἡ, vein)

Didiplis = Didiplus (διπλός, διπλός, twofold)

Distichlis = Distichus (στίχος, ὁ, row)

Epistemum = Epistemon (στήμων, ὁ, warp) or Epistema (στήμα, τό, stamen)

Euchaetis = Euchaete (χαίτη, ἡ, long hair)

Gigandra = Gigantaner or Gigantandrus (άνήρ, άνδρός, ὁ, man)

Glossocomia = Glossocome (κόμη, ἡ, hair)

Glycyosmis = Glycyosme (ὀσμή, ἡ, smell)



- Grammitis = Grammatites (γράμμα, ατος, τό, line, -ιτης)  
 Gyrocercus = Gyrocercas (κέρας, τό, horn) or Gyroceros (κερώς, ών, horned)  
 Haplolepidea = Haplolepis (λεπίς, ίδος, ή, scale) or Haplolepidus  
 Haplophlebia = Haplophleps (φλέψ, ή, vein)  
 Hedycrea = Hedycreas (κρέας, τό, meat)  
 Hippuris = Hippura (οὔρα, ή, tail, but ἵππυρις, horse-tailed)  
 Hydrangea = Hydrangium (ἀγγεῖον, τό, vessel)  
 Lagopoda = Lagopus (ποῦς, ποδός, ό, foot)  
 Lagotis = Lagus or Lagotus (οὔς, ώτός, τό, ear)  
 Leptis = Leptus (λεπτός, fine, thin)  
 Leptostachya = Leptostachys (στάχυς, ό, spike)  
 Lycianthes = Lycianthus (ἄνθος, τό, flower)  
 Macroscepis = Macroscepe (σκέπη, ή, cover)  
 Melancranis = Melanocranus (κράνος, τό, helmet)  
 Monochila = Monochilus (χέλως, τό, lip)  
 Myagrurn = Myagra (μνάγρα, ή, mouse-trap)  
 Nemacaulis = Nematocaulus (καυλός, ό, stalk)  
 Neurada = Neuras (νευράς, άδος, ή, a plant)  
 Odontoptera = Odontopterum (περόν, τό, feather)  
 Oncogaster = Oncogaster (γαστήρ, γαστρός, ή, belly)  
 Pachnolepia = Pachnolepis (λεπίς, ίδος, ή, scale)  
 Pentachaeta = Pentachaete (χαίτη, ή, long hair)  
 Phaenopoda = Phaenopus (ποῦς, ποδός, ό, foot)  
 Rhizobotrya = Rhizobotrys (βότρυς, ό, bunch of grapes)  
 Rhyncholopha = Rhyncholophus (λόφος, ό, crest)  
 Sciuris = Sciurus (σκίουρος, ό, shadow-tail, squirrel)  
 Sclerostomum = Sclerostoma (στόμα, τό, mouth)  
 Scotophylla = Scotophyllum (φύλλον, τό, leaf)  
 Therofoa = Therophonum (θηροφόνος, ον, killing wild beasts)  
 Xylostyla = Xylostylus (στῦλος, ό, pillar)  
 Zygopeltis = Zygopelte (πέλτη, ή, shield)

A consideration of duplicates arising out of the above cases, or from alternative words, will be found in section IV.

## III

Terms are invalid unless properly transliterated; retroactively, all improper transliterations are to be corrected.

"Nomina generica Graeca Latinis literis pingenda sunt." *Critica Botanica* 127.

"The strict Latin orthography can not be too rigorously insisted upon; consistency will in no other way be attainable." Miller, *Scientific Names* 127.

The following table shows the proper transliteration of Greek vowels, diphthongs, and consonants into Latin. For the sake of uniformity, alternative transliterations (such as a for  $\eta$  final, e for  $\epsilon$ ), are avoided.

$\alpha = a$	$\alpha\iota = ae$	$\beta = b$	$\rho = r$
$\epsilon = e$	$\alpha\nu = au$	$\gamma = g$	$\tau = t$
$\eta = e$	$\epsilon\iota = i$	$= n$ before $\kappa$ ,	$\phi = ph$
$\iota = i$	$\epsilon\nu = eu$	$\delta = d$	$[\gamma, \chi \quad \chi = ch$
$o = o$	$\eta\nu = eu$	$\zeta = z$	$\psi = ps$
$= u$ in final -os,	$\alpha\iota = oe$	$\theta = th$	$\gamma\kappa = nc$
$v = y$	$[ov \quad ov = u$	$\kappa = c$	$\gamma\chi = nch$
$\omega = o$	$\upsilon\iota = yi$	$\lambda = l$	$\gamma\gamma = ng$
	$\alpha = a$	$\mu = m$	$\dot{\rho} = rh, \rho\rho = rrh$
	$\eta = e$	$\nu = n$	$' = h$
	$\psi = o$	$= m$ in final -ov	
		$\xi = x$	
		$\pi = p$	
		$\sigma, s = s$	

Medial ' ( $h$ ) arising from word-formation is to be transliterated, thus preventing elision of a preceding vowel, unless its presence is already shown by aspirating the preceding consonant, as in  $\epsilon\phi\acute{\eta}\mu\epsilon\rho\alpha$ . Latin usage is variable in this particular, since words already compounded in Greek, in which the aspirate was not visible, were transliterated into Latin as they stood, while in other words in which the presence of the aspirate was felt or known, the latter was transliterated. In scientific words it is important that the rough breathing be rendered by  $h$ , not only in order that the terms of a compound may be readily recog-

nized, but also to avoid the possible confusion of two compounds otherwise exactly alike.<sup>1</sup>

The following list will serve to illustrate the more frequent errors in transliteration, and their correction.

Adenocaulon = Adenocaulum (or, much better, Adenocaulus, the last term being *καυλός*, *ὁ*, stalk); Lachnocaulum

Agropyron = Agropyrum (*πυρός*, *ὁ*, wheat)

Aerophyton = Aerophytum (*φυτόν*, *τό*, plant); Petrophytum

Ampelodesmos = Ampelodesmus (*δεσμός*, *ὁ*, band)

Amphicarpon = Amphicarpum (better, Amphicarpus from *καρπός*, *ὁ*, fruit)

Acrospeira = Acrospira (*σπείρα*, *ἡ*, knot, coil)

Amorpha = Amorphe (*μορφή*, *ἡ*, form)

Arachnion = Arachnium (*ἀράχνιον*, *τό*, spider's web)

Apios = Apius (*ἄπιος*, *ἡ*, pear, pear-tree)

Aplopappus = Haplopappus (*ἀπλός*, simple)

Arctostaphylos = Arctostaphylus (better, Arctostaphyle from *σταφυλή*, *ἡ*, bunch of grapes)

Astrebla = Astreble (*στρέβλη*, *ἡ*, roller, *στρεβλός*, *ἡ*, *όν*, twisted)

Batodendron = Batodendrum (*δένδρον*, *τό*, tree); Linodendrum, Phorodendrum, Rhododendrum, Toxicodendrum

Blepharoneuron = Blepharoneurum (*νεῦρον*, *τό*, fibre, nerve)

Brachychaeta = Brachychaete (*χαίτη*, *ἡ*, hair)

Callirhoe = Callirrhoe; Glycyrrhiza, Coralliorrhiza, etc.

Chaetochloa = Chaetochloe (*χλίη*, *ἡ*, grass); Echinochloe, Eriochloe, Helochloe, Leptochloe, Scolochloe

Chamaecladon = Chamaecladus (*κλάδος*, *ὁ*, shoot)

Chamaenerion = Chamaenerium (*νήριον*, *τό*, oleander)

Chamaerhodos = Chamaerhodus (better Chamaerhodum, *ῥόδον*, *τό*, rose)

Chionyphe = Chionohyphe (*ὕφή*, *ἡ*, web)

Cheiranthus = Chiranthus (*χείρ*, *ἡ*, hand); Chiromyces

Coilomyces = Coelomyces (*κοῖλος*, hollow)

<sup>1</sup>Linné. *Critica Botanica*, 129. 1737.

Dall, W. H. *Nomenclature in Zoology and Botany*, 55. 1877.

Kuntze, Otto. *Revisio Generum Plantarum*, 3:354. 1893.

Miller, Walter. *Scientific Names of Latin and Greek Derivation*. *Proc. Cal. Acad. Sci.*, 1:127. 1897.

- Cyperus = Cypirus (κύπειρος, ὁ, marsh plant)  
 Corypha = Coryphe (κορυφή, ἡ, head, top)  
 Dasyllirion = Dasyllirium (λείριον, τό, lily)  
 Diospyros = Diopyrus (πυρός, ὁ, wheat)  
 Dolichos = Dolichus (δολιχός, long)  
 Eleocharis = Helocharis (ἔλος, τό, marsh)  
 Elodea = Helodes (ἐλώδης, marshy)  
 Gyrotheca = Gyrothece (θήκη, ἡ, box); Heterothece, Tetragonotheca  
 Haplymenium = Haplohyemenium (ὑμένιον, τό, little membrane)  
 Helicoon = Helicoum (ὥόν, τό, egg)  
 Hemicarpha = Hemicarphe (κάρφη, ἡ, scale, better Hemicarphus, κάρφος, τό, scale)  
 Hydrocleis = Hydroclis (κλείς, ἡ, hook, key)  
 Hydrodictyon = Hydrodictyum (δίκτυον, τό, net)  
 Korycarpus = Corythocarpus (κόρυς, κόρυθος, ἡ, helmet)  
 Lecanidion = Lecanidium (λεκανίδιον, τό, dish, pan)  
 Lycopersicon = Lycopersicum (περσικόν, τό, peach)  
 Metroxylon = Metroxylum (ξύλον, τό, wood); Stereoxylum  
 Microthyron = Microthyrium (θύριον, τό, little door)  
 Opegrapha = Opographie (γραφή, ἡ, drawing)  
 Orophaca = Orophace (φακῆ, ἡ, lentil)  
 Potamageton = Potamogiton (γείτων, ὁ, neighbor)  
 Protalos = Protohalus (ἄλς, ἁλός, ἡ, sea)  
 Prinus = Prinus (πρίνος, ἡ, evergreen oak)  
 Rhodospatha = Rhodospathe (σπάθη, ἡ, broad blade)  
 Sicyos = Sicyus (σίκυος, ὁ, common cucumber)  
 Spirodela = Spirodele (δῆλος, visible)  
 Steirochaete = Stirochaete (στείρα, ἡ, beam of a keel); Stironema  
 Stenospermation = Stenospermatium (σπερμάτιον, τό, little seed)  
 Symphoricarpos = Symphoricarpus (καρπός, ὁ, fruit)  
 Symplocos = Symplocus (σύμπλοκος, entwined)  
 Syndesmion = Syndesmium (better, Syndesmus, σύνδεσμος, ὁ, band)



## IV

Of two or more similar terms, the earliest alone is valid, unless they show an essential difference in root, suffix, or prefix; differences of spelling, gender, or alternative termination are insufficient. Retroactively, the earliest name, if not already in the proper form, is to be corrected, while all others fall.

"Nomina generica, simili sono exeuntia, ansam praebent confusionis." *Critica Botanica* 43.

"Nomina generica ex aliis nominibus genericis, cum syllaba quadam in fine addita, conflata, non placent." *Ibid.* 38.

Similar generic names have long constituted a grave source of confusion in biology. Nearly every writer upon botanical nomenclature has appreciated this fact, and has suggested some method of obviating the difficulty. Linné<sup>1</sup> pointed out clearly the way by which all such duplicates and apparent duplicates might be avoided, but in the subsequent rapid development of taxonomy his precepts were lost sight of or ignored. The Paris Code, though silent on this matter, unintentionally aggravated the situation by the unfortunate reservations of Article 66. In passing, it should be noted how signally the purpose of this scholarly article has been defeated by the presence of an unimportant exception. The provision that "every botanist is authorized to rectify the faulty names or terminations, unless it be a question of a very ancient name current under its incorrect form," obviously made exception only for names given by Aristotle, Theophrastus, Dioscorides, Pliny, and other Greek and Roman writers upon plants. But this exception has since been persistently misunderstood, or purposely extended to cover any incorrect name of any degree of currency whatsoever, and has finally found expression in the absurd dictum that "the original form of a name is to be retained no matter how incorrect it may be." This feeling seems to have had some influence upon the treatment of similar generic names in the Berlin Rules and in the Rochester Code. Though the statement of the rule is different, the treatment is practically identical in both. According

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<sup>1</sup> *Critica Botanica*, 39, 43.

to the former<sup>1</sup>, "similar names are to be conserved, if they differ ever so little in the last syllable; if they only differ in the mode of spelling, the newer one must fall." Also, "there are to be conserved *Adenia* as well as *Adenium*, *Apios* as well as *Apium*, *Chloris* as well as *Chlorea* and *Chlora*, *Danae* as well as *Danais*, *Hydrothrix* as well as *Hydrotriche*, *Silvaea* as well as *Silvia*, etc.; we doubt that there is any scholar who will confound them. On the contrary, *Tetrachlis* and *Tetracleis*, *Oxythece* and *Oxytheca*, *Epidendrum* and *Epidendron*, *Oxycoccus* and *Oxycoccos*, *Asterocarpus* and *Astrocarpus*, *Peltostema* and *Peltistema* are only different modes of spelling the same word, and the newer one is to be rejected if they name different genera." The Rochester Rules<sup>2</sup> provide that "Similar generic names are not to be rejected on account of slight differences, except in the spelling of the same word; for example, *Apios* and *Apium* are to be retained, but of *Epidendrum* and *Epidendron*, *Asterocarpus* and *Astrocarpus*, the latter is to be rejected." In both codes, it will be noticed that similar names are to be rejected only when the difference is merely one of transliteration of the ending, or, very rarely, of connective. A difference of gender termination or of alternative ending is considered sufficient to warrant retention, even though this difference results from incorrect formation, as in *Hydrotriche*.

Both rules are equally far from any classical warrant, and, in consequence, neither code can furnish a logical or accurate basis for the treatment of similar terms. In formulating a rule for these, however, it is impossible to give serious consideration to the views of mere logophiles, who would make wholesale rejections on the basis of slight or fancied similarities. Thus, it has been suggested that *Micranthus* and *Micranthemum* are so similar as to warrant the rejection of one, while of *Macranthe* and *Megalanthe*, *Glycyphila* and *Glycyphylla*, one should be rejected because the first two are practically identical in meaning, and the last two in pronunciation! Between the two extremes there

<sup>1</sup> Vorschläge zur Ergänzung der "Lois de la Nomenclature Botanique." Berlin, 1892.

<sup>2</sup> *Bull. Torr. Bot. Club*, 19:290. 1892.

is but one logical position, namely, similar terms are identical in nomenclature when as Greek and Latin words they exhibit no essential differences. Thus, *Cerastium*, *Ceratium*, and *Ceratia* are merely different forms of a Greek word *κεράτιον*, and are homonyms, while *Lecane*, *Lecanarium*, and *Lecanidium* are different words, the last two being formed upon the first by the use of suffixes. Frequent affixation of the same stem should be carefully avoided, however, regardless of the validity of the resulting derivatives.

Such Greek words as *ἄνθος*, *γράφεις*, *κεφαλή*, and their relatives, which are extremely frequent in nomenclature, will serve very well to show the difference between homonyms and similar yet valid terms. Besides many compounds, the lexicon shows twenty derivatives of the root *ἀνθ-*: of these, the following seventeen are sufficiently distinct to justify their use: *ἄνθος*, τό, flower; *ἀνθήλη*, ἰ, panicle; *ἄνθεμον*, τό, flower; *ἀνθέμιον*, τό, floweret; *ἀνθίον*, τό, floweret; *ἀνθέρικος*, ὁ, flower of asphodel; *ἀνθεών* (*ἀνθών*), ὁ, flower bed; *ἀνθεμώδης*, flower-like; *ἀνθεμείς*, flowery; *ἀνθεμωτός*, adorned with flowers; *ἀνθηδών*, ἡ, bee; *ανθηρίς*, flowery; *ἀνθηρίτης*, ἡ, bloom; *ἄνθησις*, ἡ, full bloom; *ἀνθητικός*, blossoming; *ἄνθινος*, blooming; *ἀνθοσύνη*, ἡ, bloom. *Ανθη*, ἡ, full bloom, flower, should be avoided in composition, since it is identical with *ἄνθος* when used as a first term, and is confusing as a last term; *ἄνθειον* is identical with *ἀνθίον*, and *ἀνθεμís* too near *ἄνθεμον* to be fortunate. The root *γραφ-* shows two series of derivatives, one based upon the root, and the other upon the stem *γραμματ-*. Of the latter, *γράμμα*, τό, letter, picture, *γραμματεῖον*, τό, document, *γραμματείδιον*, τό, small tablets, *γραμματεύς*, ὁ, scribe, and *γραμματική*, ἡ, written character, are different, while *γραμμή*, ἡ, stroke, line, is to be regarded as a mere alternative of *γράμμα*. In the first series, *γραφή*, ἡ, drawing, *γραφεῖον*, τό, pencil, *γραφείδιον*, τό, pencil, and *γραφικός*, graphic, are distinct, but *γραφίς*, ἡ, stylus, and *γράφος*, τό, letter, are alternatives. Of the derivatives of *κεφαλή*, ἡ, head, *κεφαλís*, ἡ, little head, should be avoided, but the following are distinct; *κεφάλιον*, τό, little head; *κεφαλίδιον*, τό, little head; *κεφαλίνη*, ἡ, head of the tongue; *κεφαλικός*, of the head; *κεφάλαιος*, of the head; *κεφαλαιώδης*, chief. Nomenclature would, however, become very much involved for anyone but the philologist, if all

the proper derivatives of such roots as the above were to find a place in it. Such a condition can be readily avoided if proposers of terms will take the trouble to acquire a Greek vocabulary.

# I. Homonyms.

These arise from alternative forms of the same root or stem, from mere differences of spelling, transliteration, gender or alternative ending, or from differences produced by erroneous connectives or terminations.

- |                                       |  |
|---------------------------------------|--|
| Aceras Pers. 1807                     | Calothrix Ag. 1824                             |
| Acerates Elliott 1817                 | Cerastium L. 1737 (cor. Ceratium)              |
| Aceratium DC. 1824                    | Ceratia Adans. 1763                            |
| Aceratia F. Müll. 1854                | Ceratium Alb. & Schwein. 1805                  |
| Acetabulum Tourn. 1700                | Chamaedrys Tourn. 1700                         |
| Acetabula Fries 1822                  | Chamaedryon Seringe 1825                       |
| Acetabularia Lamx. 1816               | Chamaemelum Tourn. 1700                        |
| Acetabularium Endl. 1836              | Chamaemeles Lindl. 1822                        |
| Achlys DC. 1821                       | Chamaemela DC. 1837                            |
| Achlya Nees 1823                      | Chlora Adans. 1763                             |
| Adenia Forsk. 1775                    | Chloraea Lindl. 1826                           |
| Adenium Roem. & Schult. 1819          | Chlorea Nyland. 1854                           |
| Adenogyne Klotzsch 1841               | Coleosanthus Cassini 1817 (cor. Coleanthus)    |
| Adenogynum Rehb. & Zoll. 1856         | Coleanthus Seidl 1817                          |
| Adenophorus Desvaux 1808              | Dasanthera Raf. 1819 (cor. Dasyanthera)        |
| Adenophora Fisch. 1823                | Dasianthera Presl 1831                         |
| Apios Boerh. 1720                     | Dermatocarpon Eschw. 1824 (cor. Dermatocarpum) |
| Apium Hoffm. 1814                     | Dermatocarpus Miers 1852                       |
| Calanthe R. Br. 1821 (mel. Calanthus) | Dermocarpa Crouan 1856                         |
| Kalosanthos Haworth 1821              | Desmanthus Willd. 1805                         |
| Calanthea DC. 1824                    | Desmosanthos Blume 1825                        |
| Calosanthos Blume 1826                | Dicera Forst. 1776 (cor. Diceras)              |
| Callitriche L. 1751 (cor. Callitrix)  |  |
| Calythrix R. Br. 1819                 |  |



- Diceras Endl. 1840  
 Dictyanthes Rchb. 1837 (mel.  
     Dictyanthus)  
 Dictyanthus Decaisne 1844  
 Drimys Forst. 1776  
 Drimia Jacq. 1786  
 Epiphegus Spreng. 1820  
 Epiphagus Rylands 1843  
 Eremanthis Cassini 1827 (cor.  
     Eremanthus)  
 Eremanthus Lessing 1829  
 Eremanthe Spach 1836  
 Erythranthus Hanstein 1853  
 Erythranthe Baillon 1858  
 Eurotia Adans. 1763  
 Eurotium Link 1809  
 Gamochilum Walpers 1839  
 Gamochilus Lestib. 1841  
 Glycyphylla Raf. 1819 (cor.  
     Glycyphylla)  
 Glycyphylla Steven 1834  
 Glyphia Cassini 1818  
 Glyphaea Hook. f. 1846  
 Gonatobotrys Corda 1839  
 Gonatobotryum Sacc. 1879  
 Gonyanthes Blume 1823 (cor.  
     Gonatanthus)  
 Gonatanthus Klotzsch 1840  
 Grammocarpus Ser. 1825 (cor.  
     Grammatocarpus)  
 Grammatocarpus Presl 1831  
 Heterocladia Decaisne 1841  
 Heterocladium Schimp. 1852  
 Hippobroma G. Don 1834  
 Hippobromus Eck. & Zeyh.  
     1836  
 Holophyllum Lessing 1830  
 Holophylla G. Don 1837  
 Isomerium R. Br. 1830  
 Isomeria Presl 1837  
 Lecanium Presl 1843  
 Lecania Massalongo 1853  
 Lepidocarpus Adans. 1763  
 Lepidocarpa Blume 1855  
 Lepidotis Palis. 1805 (cor.  
     Lepidotus)  
 Lepidota Sterb. 1820  
 Lepidotus Fries 1836  
 Lepidotia Rchb. 1841  
 Lepidotum Dunal 1852  
 Lepisanthus Blume 1825 (cor.  
     Lepidanthus)  
 Lepidanthus Nees 1830  
 Macranthus Poir. 1813  
 Macranthea Boiss. 1840  
 Macrantha Bunge 1843  
 Macropodium R. Br. 1812  
 Macropodia Fockel 1869  
 Marainophyllum Pohl. 1825  
     (cor. Marantophyllum)  
 Marantophyllum Miquel  
     1855  
 Megalanthe Gaudin 1828 (mel.  
     Megalanthus)  
 Megasanthus G. Don 1834  
 Microglossa DC. 1836  
 Microglossum Sacc. 1884  
 Microtea Swartz 1788 (mel.  
     Microtes)  
 Microtis R. Br. 1810  
 Monochila G. Don 1834 (cor.  
     Monochilus)  
 Monochilus Fisch. & Meyer  
     1835

- Oliganthes* Cassini 1817 (cor. *Oliganthus*)  
*Oliganthos* Barneoud 1845  
*Oligotrichum* DC. 1805  
*Oligothrix* DC. 1837  
*Pachypleurum* Rchb. 1832  
*Pachypleuria* Presl 1836  
*Pachypleura* Jamb. & Spach 1842  
*Petrophile* Knight & Salisb. 1809  
*Petrophila* R. Br. 1800  
*Rytiphlaea* Ag. 1817 (cor. *Rhytidophloeus*)  
*Rhytidofloyos* Corda 1845  
*Salpianthus* Humb. & Bonp. 1808 (cor. *Salpinganthus*)  
*Salpioxantha* Hook. 1845  
*Schismus* Palis. 1812 (mel. *Schisma*)  
*Schisma* DuMort. 1822  
*Schizanthus* Ruiz & Pav. 1794  
*Schisanthus* Haworth 1819  
*Schistanthe* Kunze 1841  
*Sphaerophorus* Pers. 1794  
*Sphaerophora* Blume 1850  
*Sphaeroplea* Ag. 1824 (cor. *Sphaeropleum*)  
*Sphaeropleum* Link 1826  
*Stilbe* Berg. 1767  
*Stilbum* Tode 1790  
*Tapinanthus* Blume 1824  
*Tapeinanthus* Herbert 1837  
*Tetrandra* A. DC. 1845 (cor. *Tetraner*)  
*Tessarandra* Lindl. 1847  
*Thrixspermum* Lour. 1790 (cor. *Trichosperma*)  
*Trichospermum* Blume 1825  
*Trachysperma* Raf. 1809  
*Trachyspermum* Link 1821  
*Trichopteris* Necker 1790  
*Trichipteris* Presl 1822  
*Trichosanthus* L. 1737 (cor. *Trichanthus*)  
*Trichantha* Hook. 1844  
*Trichanthus* Philippi 1857  
*Xanthoglossa* DC. 1837  
*Xanthoglossum* Lindl. 1852

II. Terms classically different, but so similar in form as to be unfortunate. There is not sufficient warrant for the rejection of these, but their formation is to be avoided, if not, indeed, invalidated, for the future.

- Acarphaea* Harvey & Gr. 1849  
*Acarpha* Griseb. 1856  
*Chlora* Adans. 1763  
*Chloris* Swartz 1788  
*Danae* Medic. 1787  
*Danais* Vent. 1799  
*Galax* L. 1753  
*Galactia* P. Br. 1756  
*Galaxia* Thunb. 1782  
*Gliocladium* Corda 1840  
*Gloeocladia*, J. Ag. 1842 (cor. *Gloeocladium*)  
*Glyphis* Achar. 1814  
*Glyphia* Cassini 1818  
*Hydrophila* Ehrhart 1780 (cor. *Hydrophile*)

Philydrum Gaertn. 1788 (mel. Philohydrum)	Rhaphidospora Nces 1832
Isomerium R. Br. 1830	Rhaphiospora Körb. 1855
Isomeris Torr. & Gr. 1838	Syncephalum DC. 1837
Ixianthes Benth. 1836 (mel. Ixianthus)	Syncephalis Van Tieghem 1875
Ixanthus Griseb. 1839	Theriophonum Blume 1835
Lepanthes Swartz 1799 (mel. Lepanthus)	Therofon Raf. 1836 (cor. Therophonum)
Lepisanthus Blume 1825 (cor. Lepidanthus)	Xanthiopsis DC. 1836
	Xanthopsis DC. 1837

### III. Similar terms distinct classically and nomenclaturally

Actinostemon Klotzsch 1841	Diceras Endl. 1840
Actinostemma Lindl. 1847	Eritrichium Gaudin 1828
Alectra Thunb. 1784	Eriothrix Rchb. 1828
Alectryon Gaertn. 1788	Glechoma L. 1737 (cor. Gle- chonoma)
Brachylobos DC. 1821 (cor. Brachylobus)	Glechon Spreng. 1827
Brachylobium C.A. Meyer 1841	Haplocarpha Lessing 1831
Calopogon R. Br. 1813	Haplocarpaea Endl. 1838
Calopogonium Desvaux 1826	Micranthus Wendland 1798
Ceramianthemum Donati 1750	Micranthemum Michx. 1803
Ceramianthe Rchb. 1831 (mel. Ceramianthus)	Stylidium Swartz 1807
Cladodes Lour. 1790	Stylis Poir. 1817
Cladodium Bridel 1826	Trachypodium Leman 1828
Diceratium Lagasca 1815	Trachypus Reinw. & Hornsch. 1829

## V

Terms are invalid unless properly spelled; retroactively, improper spellings are to be corrected.

Apart from its application to improper formations, this thesis is of secondary importance. It is given place here merely to emphasize again the fact that nomenclature in all its aspects must rest upon a classical basis, a repetition rendered imperative for the reason that many biologists and more than one code still re-

gard the Latin of Linné as the model. In Greek, a large number of incorrect spellings have arisen from the careless practice of dropping one or more letters at the end of a word, or from the arbitrary change of the termination. The names of Theophrastus and Dioscorides, especially, have suffered mutilation, and should be restored to the original form, while the correction of later misspellings should be made upon the basis of the classical form of the terms of the compound. In the rare cases in which the spelling of a Greek word has been changed in Latin, the Greek form should prevail.

## VI

Terms are Invalid if they exceed six syllables in length; retroactively, the correction of sesquipedalian words must never take place by contraction or mutilation.

"Nomina Generica Sesquipedalia, enunciatio difficilia, vel nauseosa, fugienda sunt." *Critica Botanica* 133.

The practice of biologists with respect to the formation of extremely long terms has been so exemplary that the present rule scarcely requires postulation. Its justification may be found in the fact that inconveniently long words, more or less frequent a century ago, still appear occasionally, and that such words, if there were no definite sentiment or legislation against them, might again become frequent as the supply of primitives and short compounds becomes exhausted. It is more or less unsatisfactory to limit the length of a word by the number of syllables, since these vary greatly in length in different stems, but this is undoubtedly better than limitation by the number of letters. It is a question whether nomenclature would not gain more than it would lose, if the maximum length of words were placed at five syllables, though the number of changes necessitated would probably render such a rule unacceptable. Naturally, the present rule should not be made operative in the case of names of groups above the genus.



## VII

Hybrid terms are invalid: retroactively, Greek-Latin hybrids are to be corrected upon the basis of the Greek element, but all vernacular and personal hybrids fall.

"Nomina generica ex vocabulo graeco & latino, similibusque, Hybrida, non agnoscenda sunt." *Critica Botanica* 28.

"Everyone is bound to reject a name in the following cases:  
. . . (4) When it is formed by the combination of two languages." *Paris Code*, Article 60. 1867.

"The possibilities of the field he has opened up for us are indeed great, witness: *Smithia*, *Smithago*, *Johnsmithotoma*, *Ig-smithia*, *Smithalga*, *Smithodendron*. I dwell on this because it seems to me that botanical Latin is impure enough already without such gratuitous monstrosities." Pound. *American Naturalist*, 26:147. 1892.

"An unhappy feature of Dr. Kuntze's work, and one in vindication of which I can say nothing, is his method of constructing new names for genera. Perhaps in some distant century, when self-repeating history may have brought the return of times when scientists were mostly men of clear ethics, solid learning, and refined tastes, some such reform in plant nomenclature as that which M. Saint-Lager in these times vainly advocates will be carried into effect. If, before the advent of that good time, Dr. Kuntze's *Radlkofertoma* and *Schweinfurthafra* shall have become current for certain genera, they will be the first to be rejected." Greene. *Pittonia*, 2:277. 1892.

The indifference of many biologists to a classical standard for nomenclature reaches its logical culmination in the formation of hybrid words. Botanists especially are practically unanimous in condemning hybrids, but, in spite of this fact, carelessness and ignorance are steadily increasing the number of illegitimate words. It is unnecessary to prove that hybrids are as unfortunate in nomenclature as in philology, but it is necessary that particular attention be given to them in order that they may be avoided, or at least corrected. No biologist of any real attain-

ment can afford to stand sponsor for a hybrid name, when a trifling expenditure of time will yield a word of pure birth.

For the sake of clearness, hybrids may be divided into two classes: (1) Greek-Latin hybrids, in which one element is Greek and the other Latin; (2) vernacular hybrids, in which one element is from a modern tongue, while the other is classical, usually Latin. Each class shows hybrids in which both terms are independent words, and those in which one term is an affix. There is no essential difference between these as hybrids, but the distinction is an important one, because words of the second group are rarely recognized as hybrids on account of the slight familiarity of biologists with classical methods of derivation. The matter presents indeed some difficulty for the philologist, because of the similarity of cognate affixes in Greek and Latin, and because of Greek affixes borrowed by Latin. On account of the difficulty of detecting them, hybrids of this sort are becoming more and more common. The raising of hybrid sectional names in *ευ-*, *ψευδο-*, *-ωδης*, *-ella*, *-astrum*, etc., to the rank of generic names is contributing very largely to this result, as also the endeavor to honor a biologist by attaching all the Latin suffixes in turn to his name.

There has been considerable discussion regarding the treatment of such hybrids as *pseudorepens* and *Eucarex*. The contention is made that these words are not hybrids, since these affixes were regularly used by Latin writers, but, as a matter of fact, they are not found in classical Latin outside of borrowed Greek words in which they are a proper affix. It has further been urged that such words are scarcely hybrids, for the reason that *pseudorepens* does not mean "false creeping," but merely refers to a species of *Agropyrum*, which is not *A. repens*. Such argument is mere sophistry, since every compound or derivative which contains a Greek and Latin element, whether independent word or affix, is a hybrid. The only possible exception is found in those rare Greek words which have become so completely domiciled in Latin that their origin is no longer felt.

The correction of hybrids<sup>1</sup> is possible only when the word

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<sup>1</sup> Since the above was written, three instances of a similar correction of

arises from the combination of Greek and Latin forms, in which case the cognate or corresponding Greek form is used to replace the Latin element. In the case of vernacular hybrids, such substitution is so rarely possible that it may be entirely disregarded, and all vernacular hybrids, the majority of which are personals, are to be summarily rejected. Such names fall not only because they are hybrids, but also on account of the operation of rules I and VIII. Greek-Latin hybrids, which are current in nomenclature, are to be corrected and followed by double citation of author and reviser, but hybrids proposed in the future, being invalid under the present rule, may be corrected or ignored at the will of the reviser, who alone is to be cited for the new name in either event.

The following list will illustrate the various kinds of hybrids, as well as the method of correction, when this is possible.

I. Greek-Latin hybrids in which both terms are independent words.

Actiniceps = Actinocybe (ἄκτις, ἄκτινος, ἡ, ray, κύβη, ἡ, head)

Aureobasidium = Chrysobasidium (χρύσεος, golden, βασιδίου, τό, pedicel)

Baculospora = Bactrospora (βάκτρον, τό, staff, σπορά, ἡ, seed)

Botrypes = Botryopus (βύτρυς, ὁ, cluster of grapes, πούς, ποδός, ὁ, foot)

Callosispermia = Sclermatosperma (σκληῖμα, σκληήματος, τό, hardness, σπέρμα, τό, seed)

Claudopus = Loxopus (λοξός, slanting, crooked, πούς, ὁ, foot)

Clavogaster = Rhopalogaster (ρόπαλον, τό, club, γαστήρ, ἡ, belly)

Clypeosphaeria = Peltosphaeria (πέλτη, ἡ, small shield, σφαῖρα, ἡ, ball)

Fagopyrum = Phegopyrus (φηγός, ἡ, oak, πυρός, ὁ, wheat)

Fimbristylis = Lomatostylis (λώμα, λώματος, τό, fringe, στυλῖς, ἡ, pillar)

Fusicolla = Chytocolla, (χυτός, poured out, κόλλα, ἡ, glue)

Geminispora = Dissospora (δίσσος, double, σπορά, ἡ, seed)

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hybrids have been found in Pfeiffer's *Nomenclator Botanicus* 1:624, 1050, 1640. *Catasetum* Kunth is corrected to *Catachaetum*, *Diastemella* Oersted to *Diastemation*, and *Loroglossum* Rich. to *Himantoglossum*.

Gorgoniceps = Gorgocybe (Γοργώ, ἶος, ἡ, the Gorgon, κύβη, ἡ, head)

Hemicarex = Hemidonax (ἡμι-, half, δόναξ, ὁ, reed)

Massospora = Mazospora (μαῖζα, ἡ, barley cake, σπορά, ἡ, seed)

Muciporus = Myxoporus (μύξα, ἡ, mucus, πῖρος, ὁ, pore)

Nemacola = Nemocolus (νέμος, τό, wooded pasture, -κολός, dwelling)

Nitophyllum = Phaedrophyllum (φαιδρός, bright, φύλλον, τό, leaf)

Nothofagus = Nothophegus (νόθος, spurious, φηγός, ἡ, oak)

Nucleophagus = Caryophagus (κάρνον, τό, nut, φάγος, eating)

Onychosepalum = Onychocalyx (ὄνυξ, ὄνυχος, ὁ, claw, κάλυξ, ἡ, cup of a flower)

Pachylissidens = Pachyschizodon (παχύς, thick, σχιζόδων, ὁ, split tooth)

Peltigera = Peltophora (πέλτη, ἡ, shield, φορά, ἡ, a carrying)

Phaioclavulina = Phaeocoryne (φαιός, dusky, κορύνη, ἡ, club)

Pseudopeziza = Pseudopezis (ψευδής, false, πέξις, ἡ, stalkless fungus)

Radulotypus = Psectrotypus (ψήκτρα, ἡ, scraper, τύπος, ὁ, form)

Retiporus = Dictyoporus (δίκτυον, τό, net, πόρος, ὁ, pore)

Scirpodendron = Donacodendrum (δόναξ, δόνακος, ὁ, reed, δένδρον, τό, tree)

Septosporium = Schizosporium (σχίζα, ἡ, cleft, σπόριον, τό, spore)

Verticicladium = Helicocladium (ἐλιξ, ἑλικος, ἡ, whirl, κλαδίον, τό, branch)

## II. Greek-Latin hybrids in which one term is an affix.

Anthostomella = Anthostomatium

Bisporella = Disporyllium

Brizula = Brizyllium

Chlorosa = Chlorotes

Coryneliella = Corynisce

Cyphella = Cypharium

Dolicholus = Dolichidium

Eucaprifolium = Euaegophyllum (αἶξ, αἰγός, ὁ, ἡ, goat, φύλλον, τό, leaf)



- Eucarduus = Euacantha (ἄκανθα, ἡ, thistle)  
 Fusidium = Atractidium (ἄτρακτος, ὁ, spindle)  
 Gaurella = Gauryllium  
 Glossula = Glossidium  
 Graphiola = Micrographium (cfr. Graphis, Graphium, Graphidium, Graphyllum)  
 Hormiactella = Hormiactinium (ὀρμιά, ἡ, fishline, ἀκτίς, ἀκτῖνος, ἡ, ray)  
 Hypocrella = Hypocreatium  
 Ilicioides = Dryodes (δρῦς, δρύνος, ἡ, oak)  
 Juncodes = Thryodes (θρύνον, τό, rush)  
 Labridium = Chilidium (χέλως, τό, lip)  
 Lachnella = Lachnium  
 Lachnellula = Microlachnium  
 Lithophragmella = Lithophragmatium  
 Lophiola = Microlophium  
 Myriactula = Myriactinium  
 Nasturtioides = Napyodes (νᾶπυ, τό, mustard)  
 Phaeodiscula = Phaeodiscium  
 Pholiotella = Pholidotium (φολιδωτός, clad with horny scales)  
 Polystomella = Polystomatium  
 Pterula = Pteridium  
 Rhodiola = Rhodarium  
 Sphaerosporula = Sphaerosporyllum  
 Stigmatella = Stigmatium  
 Struthiola = Struthidium  
 Tiarella = Tiaryllum  
 Trichopeltulum = Trichopeltium  
 Typhula = Typhidium  
 Zomicarpella = Zomatocarpium (ζῶμα, ζώματος, τό, girded doublet)

### III. Vernacular-classic hybrids in which one term is a personal name.

Hybrids of this class lack even the excuse of ignorance. Nomenclature can show but one greater monstrosity, namely, the mutilated vernacular compound. Such personals can not be corrected and must fall ir-

revocably. Kuntze has been censured unjustly as the originator of the personal hybrid, since the latter was already found in numerous examples, as he himself has shown. But he deserves to be severely censured for greatly extending its use. Such atrocities as *Pseudoleskia*, *Microschwenkia*, *Gerrardanthus*, *Pringleophytum*, etc., were in existence before the *Revisio*, but they are lost sight of in the deluge of such foundlings proposed in the latter. The magnitude of Kuntze's offense against a classical nomenclature may be seen from the fact that out of 109 generic names proposed by him, 67 are personal hybrids, and the remainder are almost entirely mutilations, such as *Watsonamra*, *Clarkeinda*, *Schweinfurthafra*, *Itoasia*, etc. In the first volume of the *Revisio*,<sup>1</sup> the author gives a variety of methods by which the same botanist may be "honored" *ad nauseam* without increasing homonymy. The whole treatment manifests not only an entire absence of linguistic taste, but also an abiding ignorance of classical philology. Kuntze elsewhere<sup>2</sup> says apologetically, "Ich bin im Griechischen wenig erfahren." It is to be regretted that this feeling did not restrain him from such monstrous treatment of classical stems.

The following lists, though by no means complete, will serve to illustrate the various kinds of vernacular hybrids, all of which are to be rejected.

I. Vernacular-Greek hybrids—personals.

Bakeropteris	Beccariodendron
Balfourodendrum	Beckeropsis
Barleriacanthus	Benthamidium
Barlerianthus	Blumeodendrum
Barleriopsis	Buforrestia
Barleriosiphon	Caloknightia
Barleriotes	Chamaesaracha
Beccarianthus	Chamisso-mneia

<sup>1</sup>Kuntze, O. *Revisio Generum Plantarum*, 1:51. 1891.

<sup>2</sup>*Ibid.*, 3:214. 1893.

Christiastrum	Microschwenkia
Cordierites	Microweissia
Cyphokentia	Montagnites
Diserneston	Neobrunia
Doellochloa	Neocontarinia
Doniophytum	Neograyia
Dyerophytum	Neohuttonia
Ellisiophyllum	Neopeckia
Englerophoenix	Neoskofitzia
Epizeimeria	Neowashingtonia
Epibrissonia	Nesogordonia
Eugeniastrum	Oliverodoxa
Eugenioides	Orchidofunkia
Fritschiantha	Osbeckiastrum
Gayophytum	Palaeogrewia
Gerrardanthus	Parabesleria
Glaziostelma	Parabouchetia
Grayemma	Parapottsia
Hackelochloa	Phaenohoffmannia
Halterophora	Pleomassaria
Harveyastrum	Porteranthus
Henningsocarpum	Preussiaster
Henningsomyces	Pringleophytum
Huegeliroea	Prockiopsis
Kentiopsis	Protohopea
Kuhniastera	Protoventuria
Kuntzeomyces	Pseudehretia
Leioclusia	Pseudobarleria
Lenzites	Pseudogunnera
Ludwigiantha	Pucciniopsis
Lyonothamnus	Pycnoseynesia
Macounastrum	Radlkofertoma
Macowanites	Rhabdoweissia
Mannoglottis	Roeperocharis
Marilaunidium	Sarcolippia
Melioschinzia	Schmitzomia
Microkentia	Schroeteriaster

Sibbaldiopsis	Thileodoxa
Silvianthus	Thouanidium
Siphoneugenia	Tulasnodea
Smithantha	Urbanodendrum
Stahlianthus	Uroskinnera
Stanhopeastrum	Weinmannodora
Sternhopeastrum	Wittmackanthus
Thalianthus	Zieridium

2. Vernacular-Latin hybrids—personals.

Absolmsia	Fuckelina
Agardhina	Gerrardina
Algogrunowia	Gibberinula
Algorichtera	Greeneina
Arcangelina	Grisebachiiella
Balfourina	Harziella
Bartramidula	Hemsleya
Baumanniiella	Hendersonula
Beccariella	Hodgsoniöla
Benthamistella	Hofmeisterella
Berkeleyna	Hookerina
Bisboeckelera	Hostana
Brocchinia	Jacksonago
Caruelina	Julella
Cohnidonum	Karstenula
Cookeina	Kickxella
Crepinula	Koehneago
Delpinoina	Knyaria
Detonina	Kuetzingina
Dillwynella	Latzinaea
Drudeola	Magnusina
Eremicella	Massariella
Errerana	Massarina
Fabreola	Montagnula
Flueckigera	Mohlana
Forsteronia	Mortierella
Freynella	Munkiella
Friesula	Neilrichina



Nicholsoniella	Scopulina
Nylanderaria	Stephanina
Nymanina	Thozetella
Octavianina	Triumfettaria
Oliveriana	Urbanisol
Oudemansiella	Velloziella
Patouillardiiella	Vernonella
Peckiiella	Voglinoana
Peckifungus	Warscewiczella
Penzigina	Weddellina
Peyritschiiella	Wettsteiniella
Pfeifferago	Wildpretina
Phillipimalva	Wingina
Pringsheimina	Winterella
Richterago	Winterina
Saccardinula	Zukalina
Saccardoella	

IV. Vernacular-classic hybrids—impersonal.

Calamovilfa	Sphaeropezia
Camphoromyrtus	Tacsonia
Galedragon	Talinastrum
Gelatinosporium	Talinellum
Iguanura	Tamarindus
Liquidambar	Toluifera
Obaejacoides	Vauanthes

VIII.

Vernacular names are invalid; this rule is retroactive.

"Nomina generica primitiva nemo sanus introducit." *Critica Botanica* 22.

"Nomina generica, quae ex Graeca vel Latina lingua radicem non habent, rejicienda sunt." *Ibid.* 48.

"Not to draw names from barbarous tongues, unless those names be frequently quoted in books of travel, and have an agreeable form that adapts itself readily to the Latin tongue, and to the tongues of civilized countries." *Paris Code*, Article 28.

The vernacular name has long been the refuge of the unlettered or indifferent systematist, and will doubtless continue to be while there are biologists of this kind. The arguments against the use of vernacular terms are so obvious and cogent that they would not be dwelt upon were it not for the contradictory provisions of the Paris Code. As in so many other questions of nomenclature, Linné's pronouncement should have been regarded as final by the framer of the Code. But, as in more than one place, the Code admits a fatal exception. It is absurd to base biological nomenclature in any degree upon books of travel, and it is futile to think that an author who speaks any vernacular tongue whatever, no matter how crude and uncouth, would find it either harsh or disagreeable. Some biologists have endeavored to improve vernacular names by shortening them or by adding a Latin suffix, but such a remedy is worse than the original trouble. Correction by translation, as *Chenanthus* for *Gansblum*, is occasionally possible, and in such cases might be more fortunate than the rejection of a name. The fundamental fact still remains, however, that nomenclature is already essentially classical, and should in the future be made completely so. Vernacular names have no place in it. This condition can be made to prevail only by rejecting all such names whether past or future.

Anagrams, if they be considered words at all, are vernacular, since they are neither Greek nor Latin. They are the ultimate product of puerility or illiteracy in nomenclature. Such a series as *Filago*, *Gifola*, *Ifloga*, *Logfia*, and *Oglifa* throws a clear light upon the good sense and linguistic taste of the authors concerned. One might better make names after the fashion of *Carroll*, or take names from the "hog-Latin" of childhood. All other mutilations, like anagrams, are unpardonable offenses against nomenclature, and are to be summarily rejected.

#### I. Anagrams.

Alibum (*Liabum*)

Amida (*Madia*)

Anogra (*Onagra*)

Baziasa (*Sabazia*)

Behuria (*Hubera*)

Beriesia (*Siebera*)

Blitrydium (*Tryblidium*)

Galpinsia (*Salpingia*)

Gandriloa (Oligandra)	Nepera (Spennera)
Gelfuga (Fluggea)	Norysca (Ascyron)
Gifola (Filago)	Obaejaca (Jacobaea)
Gosela (Selago)	Oglifa (Filago)
Ifloga (Filago)	Parosela (Psoralea)
Lagatea (Galatea)	Phledinium (Delphinium)
Lebidiera (Briedelia)	Ranugia (Anguria)
Narthecium (Anthericum)	Trelotra (Rottlera)
Neoceis (Senecio)	Trilisa (Liatris)

## II. Vernacular mutilations.

Andreoskia	Isidrogalvia
Beccarinda	Itoasia
Berkleasmium	Kinginda
Bolusafra	Kurzamra
Brittonamra	Kurzinda
Cavanilla	Lippomuelleria
Clarkeinda	Maximowasia
Cosimibuena	Meyerafra
Dickneckera	Muelleramra
Durandeeidea	Razumovia
Elidurandia	Ridleyinda
Fregirardia	Schinzafra
Gomortega	Sebschauera
Gonzalagunia	Schweinfurthafra
Hallomuelleria	Watsonamra
Hasskarlinda	

## IX

A name is not valid unless its etymology and application are clearly indicated: this rule is not retroactive.

"Nomina generica, quae Characterem essentialem, vel faciem plantae exhibent, optimae sunt." *Critica Botanica* 97.

"Botanists who have generic names to publish show judgment and taste by attending to the following recommendations: . . .

. . . (2) To give the etymology of each name." *Paris Code*, Article 28.

The desirability of being able to know the etymology and application of each generic and specific name is obvious, but the rule given above will work advantageously in other matters also. An author who cites accurately the derivation of a proposed name will be much less apt to err in its construction, while the necessity for indicating its application will bring about greater accuracy in the choice of characters. Desirable as it might be, it is futile to demand that names show a proper degree of relevancy, or to reject them because they are more or less inapplicable. In matters of taste, it is both possible and highly desirable to have a standard, but it is idle to expect that it will be either appreciated or followed by the majority. Since names are to be rejected if improperly constructed, it is imperative that the exact etymology be given in each case, in order that their validity may be readily ascertained. A name then would stand or fall by its given etymology. It is extremely unsatisfactory to say of a name, for example, "from the Greek for flower;" the exact form of the Greek or Latin stem employed should be given.

## X

The termination of family, ordinal, class, and branch names shall be uniform within each group: tribes shall terminate in *-inae*, families in *-aceae*, orders in *-ales*, classes in *-eae*, and branches in *-phyta*.

"The names of divisions and subdivisions, of classes and subclasses, are drawn from their principal characters. They are expressed by words of Greek and Latin origin, some similarity of form and termination being given to those that designate groups of the same nature." Paris Code, Article 18.

The designation of all groups of the same rank by means of a common suffix is at present merely a convenience, but with the increasing minuteness of systematic work and the growing tendency toward segregation, it will soon become a necessity. Subdivisions and superdivisions will need to be set off from tribes, families, orders, and classes, and the terminations for the latter must be definitely fixed in order to secure a basis for distinguishing the next



group above and below. The number of possible divisions above the genus is fifteen, which makes it impossible that each should receive a distinct suffix. The most satisfactory method, then, will be to fix the designations for the five main groups, and to indicate sub and super divisions by prefixes, or by slight variations of the proper suffix. A further reason for this is found in the fact that cognate suffixes can alone be used, since generic names are either Greek or Latin, and that proper cognate suffixes are few. In fact, they are practically exhausted by the five principal groups, *-alis*, *-ales*, being, indeed, very hard to justify as a termination for Greek stems. It should be noted that *-phyta* is merely the neuter plural of the Greek word, *φυτόν, τό*, plant, and can be attached only to Greek stems.

The following examples will illustrate the operation of the above rule.

Protophyta: Schizophyceae: Nematogonales: Nostocaceae: Aulosirinae

Phycophyta: Chlorophyceae: Conjugatales: Zygnemataceae: Mesocarpinae

Carpophyta: Ascomyceteae: Discomycetales: Pezizaceae: Sarcoscyphinae

Bryophyta: Hepaticae: Jungermanniales: Jungermanniaceae: Aploziinae

Pteridophyta: Filiceae: Filicales: Polypodiaceae: Onocleinae

Spermatophyta: Angiospermataceae: Glumales: Graminaceae: Festucinae

## XI

In proposing generic names, the following rules are to be observed:

- (1) The name shall be a Greek substantive, i. e., not a simple adjective.
- (2) A single generic name may be founded upon the name of a botanist. Such names are only to be formed by adding *-la* to cognomina ending in a consonant and *-a* to cognomina in a vowel or *-r*, except in the case of names already Latinised, in which case the termination is first dropped.
- (3) Personal generic names shall be bestowed only in recognition of eminent services in botany.
- (4) Anagrams and geographical names are invalid.
- (5) Double generic names are invalid.

Generic names should in the future be formed exclusively from Greek, as simple Latin nouns suitable for plant names have been practically exhausted, and the formation of compound terms in Latin is awkward. Greek nominal stems of all sorts, simple or compound, with the exception of simple adjectives, such as *μακρός*, *μέγας*, etc., are readily available. The proposal of generic names in honor of rulers, patrons, collectors, friends, and relatives should be severely discountenanced. Furthermore, duplicates of the same personal, as *Saccardaea*, *Saccardia*, *Pasaccardoa*, *Saccardoella*, *Sacçardinula*, and *Beccaria*, *Beccariella*, *Beccarianthus*, *Beccardinda*, and *Beccariodendron* must be regarded as invalid, because their terminations are no longer significant endings, but mere variations, and also because they are hybrids. Anagrams, as has been pointed out before, fall because they are vernacular, or mutilated, or both. Geographical names are almost invariably vernacular also. Double generic names, such as *Dens-canis* and *Bursa-pastoris* are compounded syntactically and are hence invalid, while others, such as *Genisto-Spartium* and *Lilio-Narcissus* are mere hybrids.

## XII

In proposing specific names, the following rules are to be observed:

- (1) The name shall be a Greek or Latin adjective, referring to a character or function of the plant, or to its habitat.
- (2) Reduplicative specific names are to be avoided.
- (3) Comparatives, superlatives, and geographical adjectives are invalid; not retroactive.
- (4) Personal adjectives and genitives are invalid; not retroactive.
- (5) The specific name is invalid if the same as the generic name; retroactive.

None of the above rules are of primary importance, but their observance will materially improve the nomenclature of species. They represent the best usage at the present time, but need to be emphasized in order that they may be more generally followed. A specific name should not only mean something, but should also have a direct and evident application to some characteristic of the plant or habitat. In this connection, the necessity for the rules is obvious, though there will doubtless be dissent from the treatment of geographical and personal names. In support of the position taken on geographical names, it is sufficient to cite the names "canadensis," "carolinianus," "pennsylvanicus," "virginianus," etc., of Linnaeus, Gronovius, Elliott, and others, for species found the country over, and the names "coloradensis," "ioensis," "missouriensis," etc., of more recent writers for species which completely ignore the political limits of their native states. *Asclepias syriaca* L. is a classical example of the value of geographical names for species. The logical outcome of geographical names is seen in such absurdities as *Crataegus raleighensis* and *Panicum auburne*, and, when combined with a proper degree of illiteracy, in such nomenclatural atrocities as *Crataegus colorado* and *C. shallotte*. The genus *Crataegus* furnishes convincing proof that nomenclatural and taxonomic incompetence go hand in hand.

The practice of naming species after persons has absolutely nothing to commend it. As a rule, personal specific names are the result of a mistaken desire to honor some one, or of mere laziness. The day is long past in which a biologist can be honored by attaching his name to a species, and the honoring of other persons is not the province of nomenclature. It can not

be gainsaid that the use of personal names for species does obviate the necessity of knowing the species of a genus sufficiently well to avoid homonyms, but it is clear that such knowledge might at least make for more thorough systematic work. With respect to doublets, it is greatly to be regretted that the original rule of the Rochester Code was not permitted to stand. The Madison amendment has not only resulted in numerous absurd one-word binomials, but has actually weakened the cause of priority by making the latter override all considerations of accuracy and taste.



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## ERRATUM

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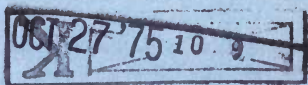
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